THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVI. No. 650.] LONDON, OCTOBER 26, 1875. [27TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
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GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
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Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

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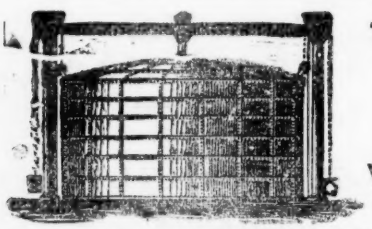

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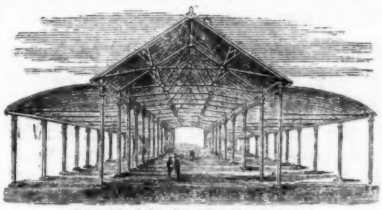

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For which Estimates will be given on application,

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PREPARED TO PLAN FOR ERECTION ABROAD,

EITHER WITH

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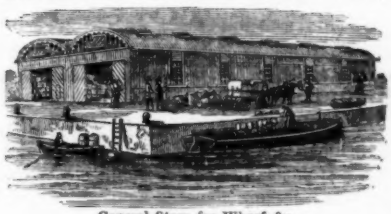

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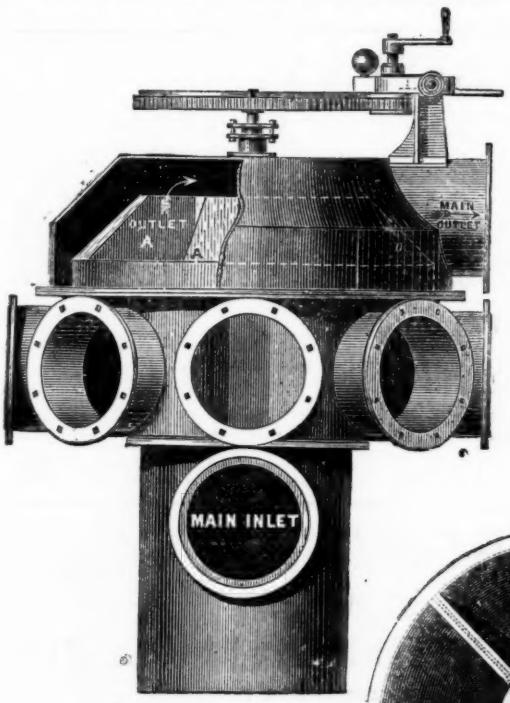
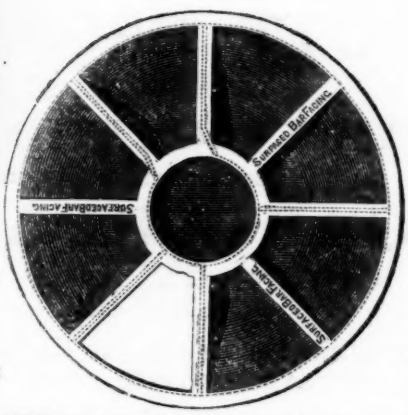
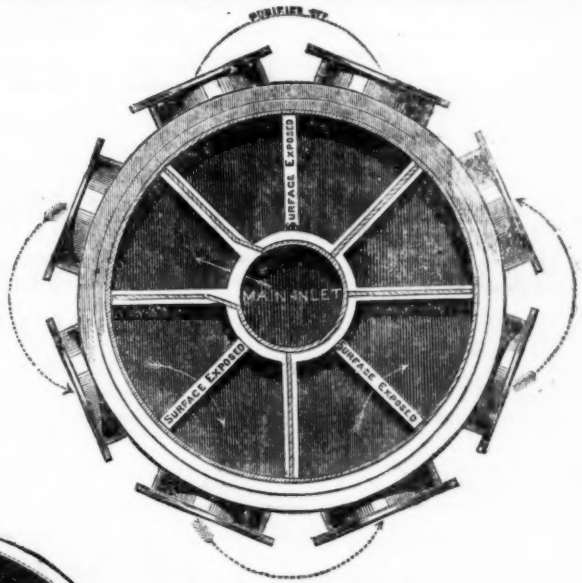
C. & W. WALKERS' PATENT CENTRE-VALVES.



Elevation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.



Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.



Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.

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TO GAS COMPANIES, ENGINEERS, &c.

These Works are in full operation, and it will be the aim of the New Company not only to keep up the excellent workmanship of their predecessors, but, by the introduction of special machinery, to manufacture **Meters of a higher standard than is usually given, without increasing the cost.**

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The Company also manufacture Dry Meters upon the most improved principle, and all their Meters being made to standard gauges, the most accurate measurement is obtained.

Attention is also called to their Dry Meters in Wood Cases, as used by some of the London Gas Companies. These Cases are a great preservation to Tin-plate Meters, especially in seaport towns, where the air is impregnated with salt; they are also particularly suited for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

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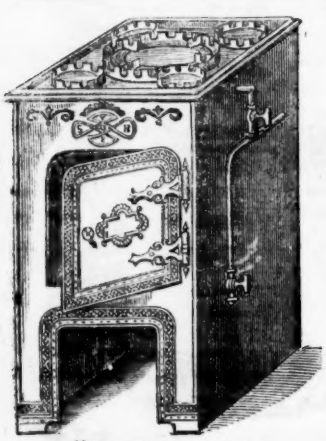

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GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

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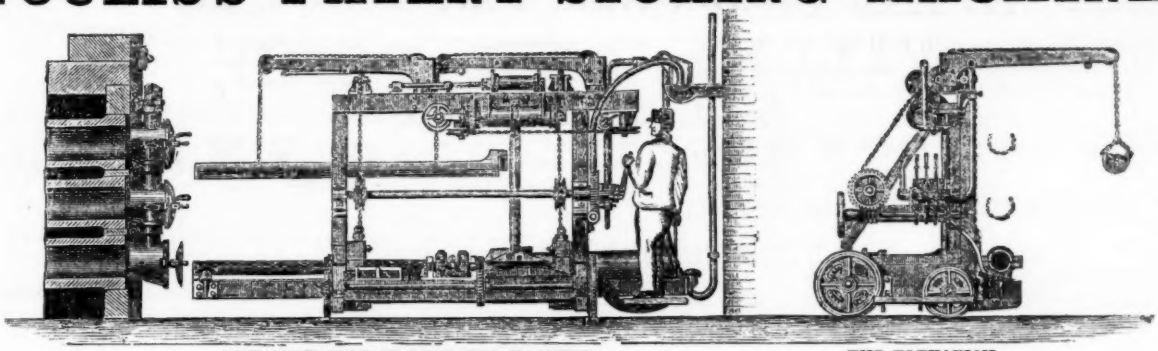

SIDE ELEVATION OF CHARGING MACHINE. END ELEVATION.

(*The Drawing Machine will be Illustrated in next week's Advertisement.*)

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This Instrument is easily fixed under any burner; it regulates the volume of gas to be consumed, notwithstanding the size of the burner or the variations of pressure.

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"New Registered Pattern" Cheerful Fireside.
Dimensions—No. 54, 1 ft. 6 in. by 1 ft. 3 in., and 2 ft. high. No. 55, 2 ft. by 1 ft. 5 in., and 2 ft. 2½ in. high.

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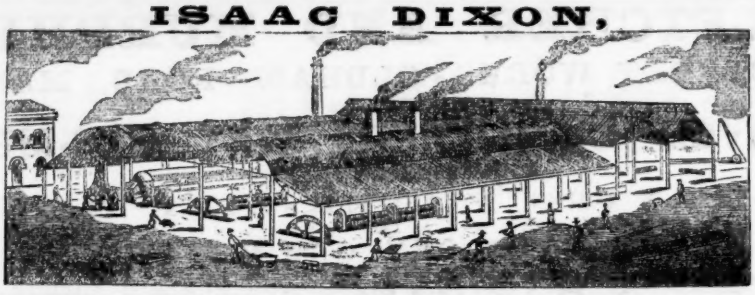

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An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

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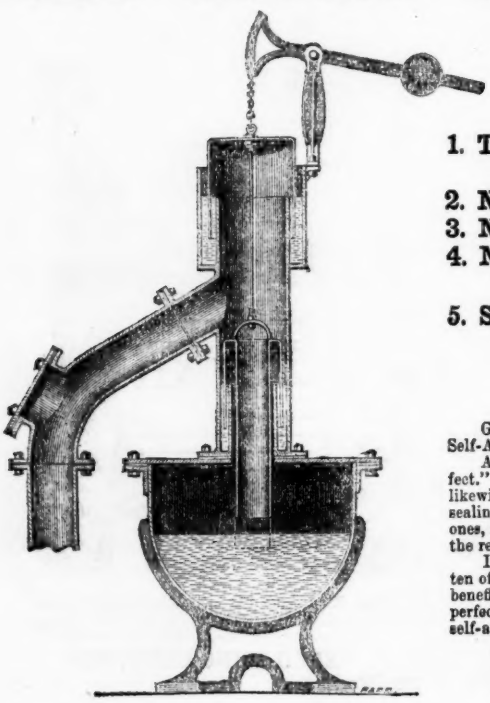

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2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

TESTIMONIAL.

Metropolitan District Asylum, Caterham, Surrey, Dec. 14, 1874.

MESSRS. CHANDLER AND STEVENSON.

GENTLEMEN,—I have much pleasure in bearing testimony to the complete working of your "Patent Self-Acting Dip-Pipes," which have now been in constant operation over three months.

As regards the action of the apparatus, I can describe it no better than by calling it "simply perfect." Immediately the retort is charged and the lid secured, the small holder rises, which lifts the Dip; likewise the instant the gas is permitted to escape at the mouthpiece the holder falls, thus perfectly sealing the Dip. I am fully convinced of the superiority of these Self-Acting Dips over Non Self-Acting ones, having experienced the fact that stokers do occasionally neglect to unseal the Dip after charging the retort, thereby causing a waste or loss.

I feel that it is quite unnecessary for me to say more on the subject, excepting that, having had ten of Messrs. Chandler's Dip-Pipes in use more than one year, and having experienced the great benefits derived thereby, inasmuch as the yield of gas from the coal is greatly increased, and the retorts perfectly free from carbon and other advantages, and seeing that the same Dip has been made perfectly self-acting by the second patent, I feel convinced that this is the right thing.—Yours obediently,

W. CRICKMAY, Resident Engineer.

For terms of use and cost, apply to Mr. G. W. STEVENSON,

4, WESTMINSTER CHAMBERS, VICTORIA STREET, S.W.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

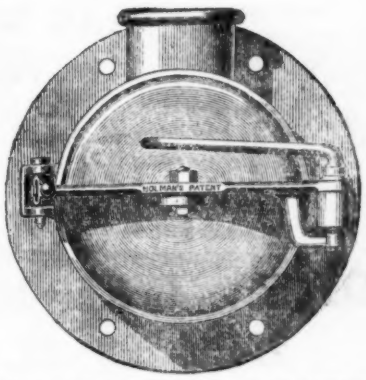
SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS,

Anti-Friction Catches and Eccentric Fastenings.



INSTANTANEOUS SEALING EFFECTED.
NO LUTING. NO DUPLICATE LIDS REQUIRED.
HOLMAN'S NEW SELF-SUSTAINING CROSS-BAR ENSURES FREEDOM OF JOINT AND MAINTAINS PARALLEL POSITION OF THE LIDS.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 20,000 being in use at various Gas-Works in London and the Provinces, among which may be mentioned:—

The Gaslight Co., Beckton (where, by the end of 1875, nearly 4000 will be in use).
" Gaslight Co., Bow Common.
" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Barnet.

The Gas-Works, Royal Arsenal, [Woolwich.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.
" Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.

The Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.
" Bournemouth do.
" Ystrad do.
" Cardiff do.
" Rochester do.

The Keighley Gas-Works.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly,
(Signed) G. C. TREWBY.

VIENNA EXHIBITION, 1873.—The highest prize and only Medal "for Progress" for Direct-Acting Steam Pumps for general purposes was awarded to TANGYE BROTHERS AND HOLMAN, Engineers, London, for

THE "SPECIAL" DIRECT-ACTING STEAM PUMPS.

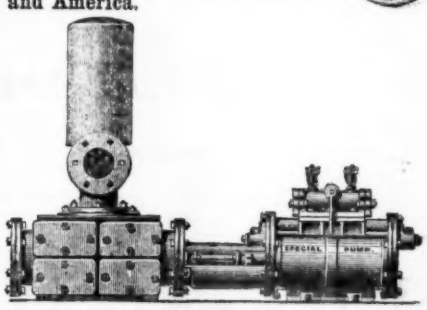
Upwards of 12,000 have been sold in England and America.

In use in upwards of a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Intending Purchasers are particularly requested to observe the great length of stroke of these Pumps, as compared with the short stroke of Pumps of other makers, as the durability of the machine greatly depends upon this.

The following sizes are those usually supplied to Gas-Works. Those marked, * being usually selected for pumping Tar and Liquor, are nearly always in stock, fitted up expressly with Pump details in iron, and extra length distance-piece between steam and pump cylinders, at a small extra cost.

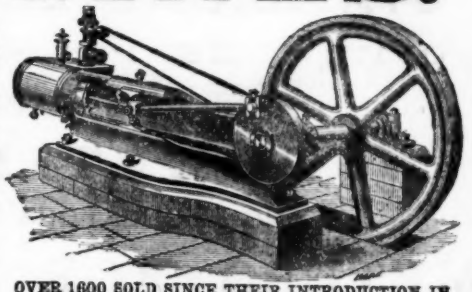
Diameter of Steam Cylinder . in.	3	*4	*5	*6	5	*7	6	*8	7	*10	10
Diameter of Water Cylinder . "	1½	2	3	4	5	5	6	6	7	7	8
Length of Stroke . . . . . "	9	9	12	12	12	12	12	12	12	12	18
Gallons per hour approximate .	450	815	1830	3250	5070	5070	7330	7330	9750	9750	13000
REDUCED PRICES. . . .	**£16**	**£18**	**£22 10**	**£30**	**£27 10**	**£40**	**£40**	**£50**	**£50**	**£65**	**£75**



TANGYE'S HORIZONTAL HIGH-PRESSURE EXPANSIVE STEAM-ENGINES.

In designing this Engine the utmost regard has been paid to simplicity of arrangement, strength of construction, and economy in cost. The working parts are considerably reduced in number, as compared with Horizontal Engines generally, rendering it far more durable and compact, the bed-plate, front cylinder cover, guides, and plummer-block for crank-shaft bearing being all cast in one piece, which in design and proportions is admitted by competent engineers to be perfect, and to afford a strength and rigidity that cannot possibly be attained in the best fitted engines of the ordinary horizontal type. The extraordinary stiffness of this Engine will permit of its being driven at a much greater maximum speed than engines generally, and with far less wear and tear. The cylinder with its valve-chest is bolted to the end of the bed. The cross-head slippers and connecting-rod ends are made adjustable, so that any wear can be readily taken up. The fly-wheel, cylinder-end, connecting-rod, and crank-plate, are all bright. All the parts are made to Whitworth's Gauges, and the material and workmanship are of the highest class throughout.

The Governor is of a very special description, and combines in the small space usually occupied by the ordinary steam stop-valve, a governor, throttle-valve, and stop-valve complete. It is exceedingly sensitive, simple, and compact.



These Engines are adopted in Gas-Works at Greenwich (Phœnix Gas Co.), Haggerston (Independent Gas Co.), Nine Elms (London Gas Co.), Falmouth, Harrow, Jersey, Plymouth, Richmond, Rochdale, Santiago (Chili), &c.

OVER 1600 SOLD SINCE THEIR INTRODUCTION IN DECEMBER, 1869.

London 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 26, 1875.

Circular to Gas Companies.

The progressive triumph of the policy of amalgamation, so long and consistently advocated in this Journal, can only be a matter of undisguised satisfaction to us. It is now nearly seven-and-twenty years since, in the first number of the Journal of Gas Lighting, the late Editor propounded a scheme for the combination of all the then existing metropolitan gas companies into one. The motives for amalgamation were not then precisely what they are to-day. A ruinous competition was going on, under which some of the companies succumbed, while only a few of the thirteen could be considered to be in fairly prosperous circumstances.

In time, however, came the districting arrangement, which changed the face of gas affairs in the metropolis. But Mr. Barlow was still an earnest advocate of amalgamation, and, in 1859, he published a letter, addressed to Sir George Cornewall Lewis, then Home Secretary, in which he once more expounded his views of the policy to be pursued in regulating the gas supply of the metropolis. On reading the letter at this date, it is a matter of astonishment to us that the proposals made therein were not at once accepted by the companies and the Metropolitan Board of Works. But they were not, and the Act of 1860 was passed. Most unquestionably, the effects of this Act have been more beneficial to gas proprietors than the proposals made by Mr. Barlow would have been. Ten per cent. dividends and large reserve-funds were secured; but, with the accompaniment of incessant agitation. The consumers have, however, suffered proportionately. All the benefits now sought to be obtained, even that of a sliding-scale, to a modified extent, would have been secured if Mr. Barlow's proposals had been adopted.

Circumstances have, indeed, somewhat changed since 1859, but everything to-day indicates the advisability of a general amalgamation. It is so obviously to the advantage of the companies to combine, that nothing need be said on that score; and, moreover, combination is strongly recommended by Government. We have now, so to speak, to tide over some ten years, in the course of which we may hope that an efficient local government for the whole metropolis will be established, in which event, as we have often said, gas companies will probably disappear. In the next session it is more than likely that some measure, aiming at general amalgamation, will be promoted. It is certain to encounter the opposition of the two metropolitan authorities, unless some provision be made for the representation of these bodies in the direction of the undertakings. The arrangements respecting capital, proposed by Mr. Barlow in 1859, are to-day altogether inapplicable. The same may be said as regards limitation of dividends and price, and the quality of the gas.

At the present moment, all metropolitan gas property is practically of equal value, and the companies might fairly unite on equal terms. We have, however, pointed out that two, at least, are so favourably circumstanced, and that the capital engaged in them is so certain to produce a full dividend, that the proprietors may be considered to be entitled to have that rate guaranteed. No objection to this could be made by the authorities, who may be said to have taken these companies under their wing.

It is probable that, when arrangements for general amalgamation are considered, the question of management will become of much importance. On this point the proposals of Mr. Barlow were very explicit. His object was to give the Metropolitan Board an important share in the direction. He said nothing of the Corporation of London in his scheme, because, in 1859, there seemed to be every probability that, in another year, the Corporation would have, as they might and should have had, gas-works of their own. For reasons, however, which need not be enlarged upon, the Corporation did not get works for the supply of the City; and we are now willing to admit that they may be entitled to some share in the management of the united gas undertaking. Mr. Barlow's proposal was that the 115 directors then in office in the companies should be reduced in number to 28, and that seven additional directors should be nominated by the Metropolitan Board. We have great fear that the suggestion did not commend itself to the directorial mind in that day, but that shall not prevent us from again proposing the appointment of nominee directors in any scheme for general amalgamation. We "firmly believe," as did Mr. Barlow, in 1859, "that the admission of nominee members to "a share in the management of whatever bodies may be en-"trusted with the supply of gas, will go far towards pre-"venting the recurrence of disputes similar to those which now "exist between the public and the gas companies." The space we have at our command does not allow of a full development of the ideas of our revered friend, but we give the above as most applicable to the present circumstances, and will only add that nearly every suggestion contained in the pamphlet we quote from, has since been adopted in legislative enactments.

When metropolitan gas affairs are in question, we naturally expect Mr. J. Beal to appear in print. His communication to the *Standard* the other day, therefore, occasioned no surprise. Mr. Beal has done a good deal for the gas consumers of the metropolis, and his egotism may well be forgiven. He boasts of having opposed amalgamation in 1849, of which he certainly ought now to repent; and he claims to have been the introducer of the Act of 1868, which is now alleged to be the *fons et origo malorum* of London gas consumers. We are so heartily glad of Mr. Beal's co-operation in the work of amalgamation, that we shall not quarrel with him as to our respective shares in the promotion of this object. In all his exertions for the establishment of a municipal government for the whole of London, we need hardly say he has our hearty sympathies.

Speaking of Mr. Beal, reminds us that it is a disputed point as to who first recommended a sliding scale of dividend for the gas companies. It is quite true that a dividend, having some relation to price, was fixed in the case of the Sheffield, the West Ham, and some other companies. But that was not a true sliding scale. The first suggestion of this we find in the evidence of Dr. Challice (1858) in answer to some questions put by Mr. Roupell; but it was subsequently more precisely put forward in a report of the managers appointed by the delegates of the vestries, &c. (1858), signed by Mr. J. Beal and Mr. S. Hughes. In an appendix to this document appears a resolution to the following effect:—"That these "clauses (*i.e.*, the dividend clauses of the general Act, 1847) are "objectionable, because they allow a dividend of 10 per cent. to

"be spread over the whole works from the commencement. "The managers suggest *a sliding scale of dividend in the inverse "ratio of the price of gas.*"

Unlike Mawworm, we do not care to be abused, and undeserved abuse is very distasteful to us. A fortnight ago we made some comments on the gas accounts of the Corporation of Nottingham. Nothing could be farther from our intention than to impute misrepresentation to any officer or member of the Corporation. We were, therefore, greatly astonished on reading the report of the speech of Mr. Heath, the chairman of the Gas Committee, at the council meeting on the 19th inst. Every candid reader of our JOURNAL will have seen that we only objected to the form in which the accounts were presented. Their accuracy was never called in question; but we object to adjustments, however honestly made. It is some consolation, under the circumstances, to see that a member of the council takes our view of the matter, and asks for the accounts in a more intelligible form. The speaker, an alderman, further remarked that the balance on the possible existence of which we threw a doubt, was a "balance "of assumption." As regards the remarks we made, we have nothing to recall, and nothing to qualify. The Corporation of Nottingham took over one of the most substantial gas concerns in the country. They have a splendid opportunity of working it to the advantage of their constituents—the gas consumers —and we shall hope that they will do so. In the meantime we shall once more recommend them to adopt (with necessary modifications as to the capital account) the form of accounts prescribed for gas companies by the Board of Trade.

We print to-day, at length, the gas accounts of the Corporation of Manchester; and in this case, again, we have to regret that they are not presented in a different form. We shall not deal with capital accounts; and as regards manufacture, we may say this, that the skill and experience of the superior officers of the Corporation are so well known in the gas world, that we may be certain the best possible is being done. Still, it would be more satisfactory to know how much cannel is carbonized, how much gas is got from it, and how much of that gas is sold. Such information would afford useful means of comparison, valuable to both Corporations and companies. The comparatively small value of cannel coke is well exhibited in these accounts, which show that only one-sixth of the cost of coal has been realized for this residual.

There is but one other thing in these accounts which, from our point of view, requires notice. Since, and including, 1868, the Gas Committee have handed over to the Improvement Committee no less a sum than £58,233, in anticipation of profits. From the profits of two years, the Gas Committee have been enabled to replace £31,774 of this amount, still leaving themselves in debt to the extent of £26,457. Whence the money advanced came is not clear, but, supposing it was taken from a large balance at the bankers, it represents a sum which should be bearing interest. Are we not, therefore, correct in assuming that the gas consumers of Manchester are required to pay, not only 10 per cent. on capital, but also interest at, say, 3 per cent. on money advanced, to pay profits which have not been realized? And shall we be far wrong in saying that, if gas alone were paid for, it would be just about 1s. per 1000 cheaper in Manchester and the suburbs than it is at present?

"The glorious uncertainty of the law" was well illustrated by two county court cases reported in our last. In one, the Corporation of Huddersfield sued a consumer for the value of a quantity of gas registered by two meters. It seems that the consumer had complained of one meter, since it registered an amount considerably in excess of his previous consumption. Another meter was accordingly supplied, but the increase still went on. The judge held that the increased registration was *primâ facie* evidence that the meters were incorrect, and gave a verdict substantially for the defendant. There can be no doubt that the decision is bad, and if it should be upheld it will open the door to an immense amount of robbery. We have not the Huddersfield Act before us, but the words of the general Act of 1871 are explicit enough. The index of the meter is to be taken as *primâ facie* evidence of the quantity of gas consumed, and, if any dispute arises between the consumer and the undertakers, it is to be settled by two justices. This was the decision given by the judge of the Huntingdon Court, in which the Huntingdon Gas Company sued a consumer under circumstances very similar to those mentioned above. We hope the Huddersfield Corporation will not rest satisfied with the decision in their case. If it can be pleaded successfully, that what a consumer considers an excessive registration is *primâ facie* evidence that a meter is incorrect, the use of such an instrument may as well be abolished.

The "few items" compiled by Mr. G. Livesey reached us too late for any remarks to be made last week. They seem to us, however, to call for some notice. We presume that they are put forward to show exceptionally good results on the part of the Ratcliff and South Metropolitan, as compared with the larger companies, and they apparently do so. But some qualifications must be made. Let us take the gross cost of coal. In the case of the Crystal Palace Company, in which the price is highest, Mr. Livesey very properly points out that this company have to pay nearly 3s. per ton for railway carriage. Now, in a spirit of equal fairness, we think it ought to have been pointed out that, as regards the cost of coal on the works, the Ratcliff and the South Metropolitan enjoy exceptional advantages. The former have a wharf on the river, and have not even lighterage to pay. The latter, we believe, pay no canal dues, and the coals have only to be conveyed a short distance by lighter. With this, may be fairly compared the state of things in the case of the Imperial Company. Omitting any mention of the new station at Bromley, the heavy cost of getting coal up the river to Fulham must be noted, and the still heavier charges for getting it to the Haggerston and St. Pancras works. We think we have either seen, or heard it in evidence—we cannot, at the moment, put our hand on the figures, and, therefore, we make the statement subject to correction—that coal, delivered at the Haggerston works, costs 2s. 10d. more than at Fulham. Heavy charges must also be incurred in the transport of coal to St. Pancras. In the case of the Chartered Company, a similar state of things must, although to a less extent, prevail. The charges for conveying sea-borne coal to the old Western works must be very heavy, and lighterage up to the Lupus Street Station a very considerable item. We believe we may assume that at the present time the contract price for coal of equal quality, among the metropolitan gas companies, does not vary to the extent of more than a few pence. The difference in cost represents simply the charges for getting it to the works. We make no reference to the cannel in the case of the Chartered Company. But for that, we have no doubt that the price of coal in their instance would stand fourth in order. Facilities for receiving coal mean also facilities for the removal of residuals at a cheap rate; and, therefore, contractors can afford to pay a higher price for them. As regards coke, we are charitably disposed to believe that managers and directors combine to obtain the best possible price for it, and it is very easy to discover the circumstances which make that residual of less value at one station than another.

A committee of the Ramsgate Local Board have commenced negotiations with the Isle of Thanet Gas Company, and now recommend the board to take the necessary steps, under the Borough Funds Act, to obtain the sanction of the ratepayers for the promotion of a bill to acquire both the gas and water undertakings.

It does not appear that any steps will be taken this year by the Corporation of Liverpool towards the purchase of the gas company. The special committee appointed by the Town Council last year to consider and report on the question, have not yet completed their investigations, and as their term of office expires next month, they ask to be reappointed.

The public lighting arrangements in St. Pancras are not giving general satisfaction. No one appears to quarrel with the average meter system adopted by the vestry, but complaints are made that the vestry attempt to save by injudiciously curtailing the hours during which the lamps are lighted. In particular, it is alleged that, whereas the Imperial Company used to have all the lamps lighted before the hour of sunset, the vestry now start the lamplighters at sunset, and the consequence is that some lamps are not lighted until an hour after. This is a matter which lies between the vestry and their constituents, but we venture to remark that any attempt to save the consumption of gas during the winter months is a mistake. During the summer, large savings may be made without public inconvenience.

It is a gratifying circumstance that amid all the agitation now going on, the market value of gas property continues to improve. The best now fetches a price which yields very little more than 5 per cent., and rumour says that the largest buyers are a popular bank, who pay small depositors interest at the uniform rate of 4 per cent. We are glad to see the property passing into such hands; but should be better pleased to see it going directly into the possession of small investors.

In another column Mr. Cleland replies, at some length, to the objections which have been urged against the steam-jet exhauster, and shows that the jet does not necessarily produce weak liquor. It is, however, pointed out to us by an esteemed correspondent, "An Old Gas Engineer," that the jet may be very properly applied to the purified gas, and the condensed steam returned to the boilers. We understand that the steam-jet exhauster has been for some time at work at the Silvertown station of The Gaslight and Coke Company, with most satisfactory results; and the correspondent, to whom we have referred above, expresses his conviction that, in a few years, a jet of steam will be the only method of exhausting in use in gas-works.

Water and Sanitary Notes.

THERE is once more an agitation respecting the well water supply of London. The City wells were placed under a ban years ago, when an outbreak of cholera seemed imminent, but we believe that the inhabitants continue to use the water of most of them; and, so far as we have heard, not the smallest harm has resulted. The water is, in most cases, bright, sparkling, and very agreeable to the palate, and it is drunk with pleasure. It contains, as a rule, but little unoxidized organic matter, but often an abundance of nitrates, the imbibition of which is harmless, if not healthful. The water has been used for long, long years past, without any evil consequences; but now it is proposed that the wells shall be instantly closed, because the use of the water is "fraught with "serious danger to the public health." Other wells outside the City of London we see described as "foci of epidemic disease," the fact being that no spread of epidemic disease can be traced to any one of them. We have no objection to the closing of the wells, but, in the name of science and common sense, we must protest against the gross exaggerations indulged in by writers on the subject. Newspaper notoriety is, however, a sad temptation to men in these days.

The inhabitants of Forfar are loth to give up the use of their wells, although they have been told, over and over again, that the water is dangerous to health, and quite unfit for domestic use. The fact is, that Forfar continues reasonably healthy, and if the causes of such disease as exists were traced, it is quite likely that as much might be ascribed to *whuskey* as water. In like manner we might say that the health of men in the City of London is probably much more damaged by numerous glasses of "bitter," and brandies and sodas, than by water from the City pumps. The Police Commissioners of Forfar are, however, anxious to introduce a public supply of what may be called good water, and they consulted the ratepayers, 3201 in number, as to whether a public supply should be obtained or not. The result was that 1870 voted, and of these, 1488 were opposed to the new supply. Forfar is a very insignificant place, and we only quote the case as giving an expression of public opinion. In this instance it is clear that the people best able to judge consider the alarming statements of the Police Commissioners to have no foundation in fact.

The water question in Liverpool will remain in abeyance until the new councillors are elected. A fitting close to the proceedings of the Water Committee for the year, was made by the passing of a unanimous vote of thanks to the chairman, Mr. Wilson. The vote was well deserved, and Mr. Wilson is certain of re-election to the post he has so admirably filled. Next year the council must come to some decision as to the future water supply of their borough and district, and Mr. Wilson's services are essential to the Corporation. He is understood to favour the Ullswater scheme; but it is certain that any plan that may be submitted will receive his careful and unbiassed consideration.

The water question at Leicester is to be made a sort of test at the coming municipal elections. It is not easy to see at present how the struggle may terminate. Opinion, so far as we are able to ascertain, seems pretty nearly balanced. It is certain, however, that the Corporation can take no action in the next session of Parliament, and time will thus be afforded for a full and fair consideration of a question of the utmost importance to the interests of the borough.

The Dundee Commissioners, in their extremity, have very sensibly instructed Messrs. Harrison and Hawksley to report on the whole subject of their new water-works.

MERTHYR TYDVIL SEWAGE FARM.—The annual report of Dr. Dyke, the medical officer of health of Merthyr Tydvil, bears testimony in favour of a well-managed sewage farm. Speaking of a plot of 20 acres laid out to receive sewage on Mr. Bailey Denton's plan (intermittent downward filtration), Dr. Dyke observes how cleanly, odourless, and perfect in all its details is the action of the system. As part of his duty, he has "from time to time examined the water flowing out, and satisfied himself that there has been no perceptible increase in the amount of organic matter dissolved therein." For in July 1872, it was proved by the investigation made by Dr. Frankland to contain only one part of organic matter in 200,000 parts of water; and in 1874 it was found still just as free from impurity, showing that no saturation of the soil went on, the growth of vegetables on the surface, and the aëration effected by drainage doing the work of purification effectually. In another part of the report which treats of the classes of disorders met with in the district, Dr. Dyke recalls certain prophecies, made when the sewage farm system was introduced, that the vegetables first grown under its means would act prejudicially on the public health. So far from this being the case at Merthyr, there are hundreds of young children brought up on the milk of store-kept cows, fed partially on grass grown on sewage-irrigated meadows; yet the mortality among them from diarrhœa and similar complaints is exceptionally low, and all medical men in the district agree that this type of disease among persons of all ages has diminished of late years, for the plain reason, no doubt, that whilst sewage-irrigated vegetables have been introduced, a good water supply and a thorough system of drainage have been introduced with them.—*Local Government Chronicle.*

STRIKE OF LAMPLIGHTERS AT BARNSLEY.—The *Wakefield Express* states that last Tuesday night the streets of Barnsley were in all but total darkness, owing to a strike of the lamplighters for an advance of 2s. per week on their present wages. No concession has been made, and the town is likely to be left in the same state for some nights to come.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

LXX.

The engravings on next page represent the elevation, part of which is in section, and half of the plan of a gasholder, 84 feet in diameter, and 22 feet deep, with its corresponding cast-iron tank, 87 feet 6 inches in diameter, and of similar depth to the holder.

The tank, as shown, is made of a greater diameter than is necessary for a single holder, it being so constructed for the purpose of converting the apparatus to the telescopic system, whenever from the business of the company increasing, the extra gas storeage would be required. This precaution has been observed by companies of limited capacity when desirous of restricting the expenditure of capital to their more immediate wants, at the same time making provision for increased consumption.

Under such conditions, the tank is slightly increased in diameter, and the capitals of the columns arranged to receive the upper columns. Beyond this, no extra expense is incurred at the time of erection, whereas at a future period the capacity of the holder can be doubled by rendering it telescopic. But although this plan has been adopted, the economy derived therefrom must frequently be very doubtful, inasmuch as the labour and inconvenience of emptying the tank and working therein, the extra expense incurred by cupping the holder *in situ*, and the erection of the outer holder under disadvantages, all tend to increase the cost very materially beyond that of the erection of a telescopic gasholder in the first instance.

We are of opinion that no special advantage can arise from changing from the single to the telescopic system, as described, unless a number of years intervene between the first construction and the alteration. The progress of gas companies, at the present time, may be regarded as definite, the annual increase being generally about equal to 10 per cent., following progressively year by year, although in many instances this rate is exceeded. With this datum to proceed upon, the requirements of a gas-work, and, consequently, the proper dimensions of the gasholders, may be readily estimated for 10 or 20 years to come.

The engraving, in elevation, shows the method of constructing cast-iron tanks. There are five tiers of plates forming the sides, with the corresponding wrought-iron hoops already referred to. The bottom of the tank, as seen in section, is composed of a large centre-piece, which may be of one or more plates, and nine concentric rings of plates, the lowest tier of the side being bolted to a vertical flange, cast on the outer ring of plates forming the bottom. The standards, or guide-columns, are cylindrical, the description almost universally adopted, whether for large or small gasholders. These columns, when of great length, are cast in two or more pieces, turned at the points of junction, and secured together with cotters; and, as in the present case, where the ultimate intention is to render the holder telescopic, the standards are arranged to receive another tier of columns to be superposed thereon, with their corresponding girders, chairs for pulleys, and counterbalance weights.

The girders of holders are of varied designs, some exceedingly ornamental, and frequently constructed of cast iron. Those represented are of wrought iron, which possesses the advantage of non-liability to breakage in transport, and more particularly in shipment.

The holder, represented partly in section, in addition to the roof trussing, is supported by trussing at the sides. One of these trusses is placed opposite to each column, and consists of a 5-inch T-iron upright, bolted to the bottom and top curbs, with a strut, as shown, and tie-rods, the strut being tightened by the two screws. Frequently, in holders of 50 feet diameter, the trussing is simply an angle iron, whilst in holders of smaller dimensions the side trussing is dispensed with. This trussing, however, like that of the roof, is only necessary to sustain the sides when the holder is down, and deprived of the support of the gas within; but it may be stated that the weight of the sides, in consequence of the increased pressure it gives, aids in supporting the roof.

The drawings are represented as the holder was actually executed, and in this we find a deviation from the established rule, in the attaching of the tension-rods to the main bars, instead of to the crown-plate, affording another instance of the diversity of opinion existing amongst manufacturers of this apparatus.

The other engraving represents the half plan of the holder, and shows a portion of the roof covered with the sheets; the other portion showing the trussing of roof, which is similar to that described but having, in addition to the main bars, secondary bars, which extend from the third ring of purlins to the top curb.

The principal parts of the holder in question are as follows:—

The crown plate, 7 feet in diameter, and half an inch thick.

The top and bottom curbs, 5 inch by $\frac{1}{2}$ inch angle iron, strengthened by the outer row of plates of roof, 3 feet 9 inches wide, of No. 7 gauge.

The top and bottom tiers of plates, as well as those rivetted to centre plate, are of No. 8 gauge. All the rest of the plates are No. 12 gauge.

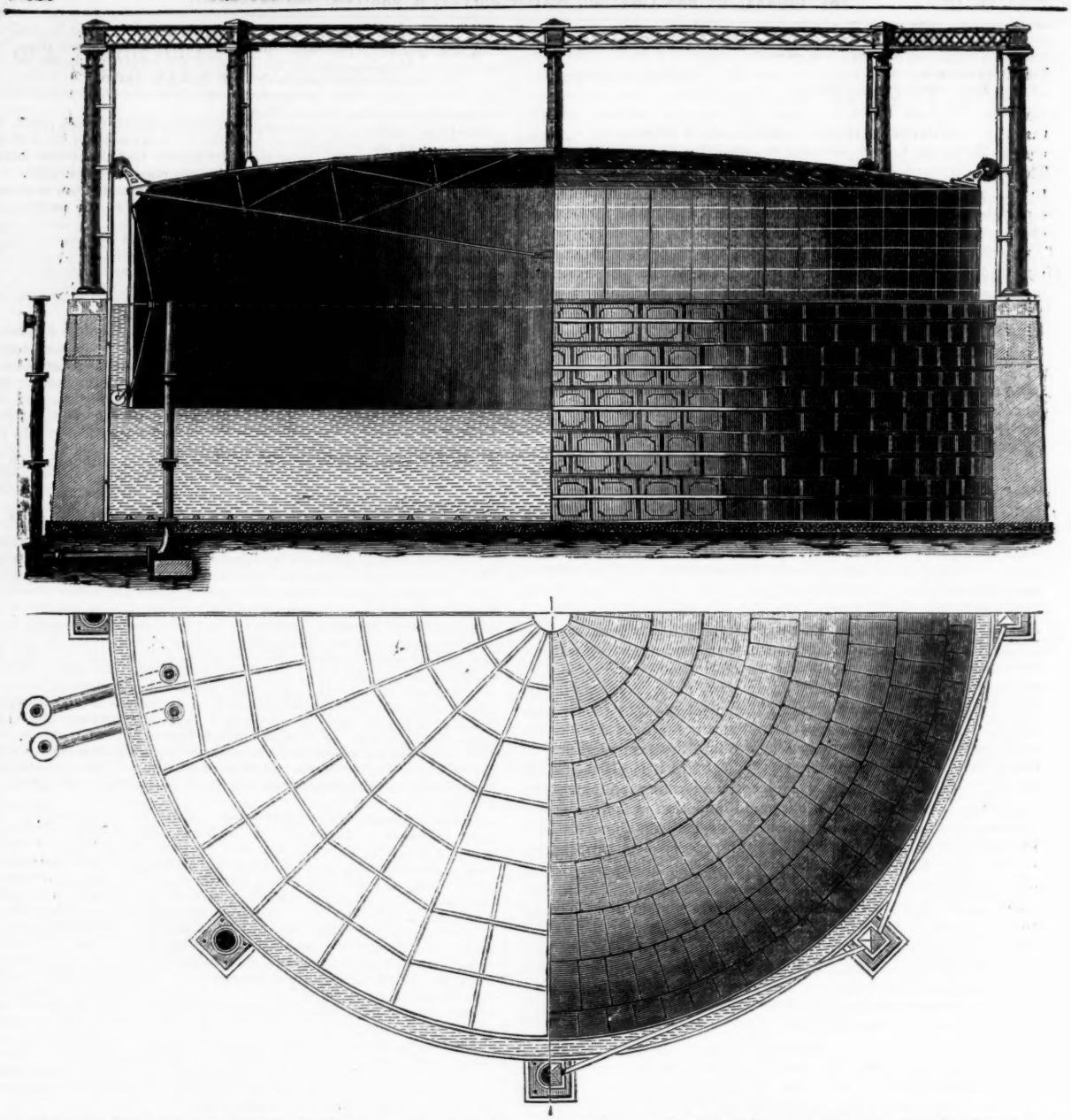
The main bars are 5 inches by 3 inches by $\frac{1}{2}$ inch T-iron.

The secondary bars, $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by $\frac{3}{8}$ inch T-iron. All the purlins are of angle iron.

The outer ring and fifth ring of purlins being 3 inches by $2\frac{1}{2}$ inches by $\frac{3}{8}$ inch.

The second and sixth rings being of 3 inches by 2 inches by $\frac{3}{8}$ inch.

The third ring being 4 inches by $2\frac{1}{2}$ inches by $\frac{3}{8}$ inch, and the sixth row, 2 inches by 2 inches by $\frac{1}{4}$ inch.



The centre pipe or king-post is 12 inches in diameter, and 20 feet long; and the truss cup, 5 feet in diameter at the bottom.

The suspension rods are 1½ inch round iron.

The inlet and outlet pipes, 18 inches in diameter.

The estimated price for this gasholder and tank delivered at railway station was £4650.

In the JOURNAL of the 12th inst., reference was made to a gasholder-tank constructed by Mr. Evans at the Westminster station of the Chartered Company, and it was described as a cast-iron annular tank. We have since learned that this is not so, the tank in question being of wrought iron, and annular only to a limited extent. The gasholders, themselves, were without any framing; but the top curb of the inner gasholder was formed as a box girder, so as to resist the strain produced by the tendency to draw in the sides of the holder. A timber framing was provided to carry the roof of the holder when down. We are indebted to the courtesy of Mr. Evans for this correction, and also for the promise of a drawing of the tank, which will be engraved for a future number.

(To be continued.)

Correspondence.

LONDON GAS COMPANY'S COKE SALES.

SIR,—Mr. Livesey's table in your JOURNAL this week appears to show, at first sight, rather different results from mine, as regards the produce from coke, and I regret to find I have made one error in stating the gross produce of the South Metropolitan Company per ton *carbonized* at 7s. 3·19d., which should be 7s. 8·1d., or, as Mr. Livesey calculates per ton *used* 7s. 7·6d., being a fraction over the produce of the London Company.

The main difference between Mr. Livesey's figures and mine is, that whilst he shows the *net* produce of coke per ton, I have shown the *gross* produce.

I think my method the fairer as a comparison of sales, because we can place tolerable reliance on the statements as to gross sales; but opinions appear to differ as to what charges should fairly go against coke, and the rate per chaldron of the charges of the different companies varies considerably.

W. G. HEAD.

London Gaslight Company, Nine Elms,
Oct. 22, 1875.

UNTRUSSED GASHOLDERS.

SIR,—In the useful and interesting "Treatise," now appearing in your pages, favourable mention is made of "untrussed gasholders," which are also sometimes designated "flat top holders." About this latter title I wish to make a remark, in the first place, to inquire why untrussed gasholders were originally made with a flat top? Possibly owing to the very small size of gasholders in those days. But the more important question is, Why are these holders of large size made in the present day with flat tops? The only answers I can give are, first, that *they always have been so made;* and, second, that *it is supposed to be easier* to construct the timber framing (which has to support the crown when at rest) of a flat than a domed shape.

Now, one of the greatest, if not the greatest objection that has been made to "untrussed holders," is the much heavier strain thrown on the crown sheets, owing to the flatness of the crown—a very reasonable and forcible objection. But why make the crown flat?

This question occurred to me when designing my last holder, and I made some simple experiments, to determine the difference in the strain on the crown sheets with a varying rise of the crown; and I found that, in the case of my holder of 180 feet diameter, which untrussed was to have a rise of crown of 3 feet, but if trussed would have had a rise of 9 feet, the strain on the sheets in the latter case was just one-third of what it would be in the former. I therefore at once decided on giving the untrussed crown a rise of 9 feet, thus reducing what would have been a strain of 3 tons, on a given section of the attachment of the crown sheeting to the top curb, to 1 ton. I found no difficulty in constructing the timber framing, the cost of which, with its supports complete, was £700, against something over £2000, for the trussing which was saved; and, in addition to the money saving, there is, what I consider of more

importance, a reduction of about 100 tons in the weight of the gasholder, effecting a reduction of 2 inches of pressure, which is a decided and permanent advantage.

GEORGE LIVESEY.

South Metropolitan Gas Company,
Old Kent Road, S.E., Oct. 25, 1875.

WROUGHT-IRON ANNULAR TANKS.

SIR,—We notice in your remarks on wrought-iron annular tanks, in your issue of the 12th inst., you state that Messrs. Bower, of St. Neots, are the only firm (so far as your knowledge extends) which have given much attention to the construction of annular tanks made of wrought iron, and that the largest so made is 127 feet in diameter and 20 feet deep.

We beg to say we have designed and constructed several such tanks, the largest being that erected for the Surrey Consumers Gas Company at Rotherhithe, which is 153 feet in diameter and 25½ feet deep, and has been in use ten years. We mention this fact as we should not like it to be understood by gas engineers generally that Messrs. Bower are the only ones who have given any attention to this particular form of tank.

H. BEWLAY (for Thos. Piggott and Co.).

Spring Hill, Birmingham, Oct. 18, 1875.

[We are obliged to our correspondent for this addition to our store of knowledge on this point, and we may take this opportunity of stating to our readers generally that we shall be glad to receive information with respect to any apparatus or process which may happen to be treated of from time to time in these papers.—ED. J.G.L.]

GAS-EXHAUSTERS.

SIR,—I would have much preferred replying to your correspondent "M." of last week, had he attached his full name to his communication. It would have saved me the regret of having to break through one of my maxims—viz., never to take notice of any anonymous communications. It would further have given me the pleasure of knowing to whom I am likely to be indebted for introducing a discussion on a subject which I consider peculiarly a hobby of my own—a child whom I have hitherto nursed in secret, not being sure whether it was a proper child or not.

The views I hold on gas exhaustion, as a whole (not on *gas-exhausters*, as my friend "M." appears to infer), may be erroneous, but at present I am not convinced that they are so; nor does my friend "M." bring any statements to help to clear up the matter, or in any way alter my views on the subject. Possibly that may be in consequence of my remarks at the meeting of the West of Scotland Gas Managers Association not being sufficiently clear or explicit for his comprehension. I am more especially led to believe this from the fact that in his communication he makes me say what I had no intention of saying, and infers that, unless I had been ignorant of certain facts, which he puts in italics, I should not have committed those blunders. These inferences are entirely erroneous, and at the risk of committing further blunders, and laying myself open to further criticism, I will give my views on the subject of gas exhaustion, and let others judge as to their merits, and whether I was justified in making the remarks I did.

As I take it, gas-exhausters are employed to overcome the working pressure, or friction, of the gas passing through the various parts of the manufacturing apparatus, and to press the gas into the gasholder, the object or aim being to relieve the coal undergoing distillation in the retort of as much pressure as possible. and to prevent water-seals from being blown out, &c.; the supposed (I say *supposed*) advantages of thus removing the pressure being—

1. To prevent the deposition of carbon inside the retorts;
2. To prevent the choking of the ascension-pipes;
3. To increase the yield and illuminating power of the gas;
4. To prevent leakage through the porous clay of which the retorts are made; and
5. When steam is used direct, as in the steam-jet, the secondary advantage that the condensed steam absorbs out the ammonia, &c.

So far as the application of the water resulting from exhausting by steam is concerned, I am quite satisfied of the advantages of using an exhauster, and I am willing to admit that the leakage from retorts may be slightly diminished; but that the three first-named objects are attained, I am not inclined to admit, except to an almost inappreciable degree; and it is to these three more particularly I allude when I say that gas exhaustion is still in its infancy, and that it is so because engineers have not thoroughly investigated the subject; for, notwithstanding all that "M" has said, I maintain that, from the nature of our present apparatus, we are compelled to regulate the amount of exhaustion, or, in other words, the pressure under which we carbonize or distil our coal, to that of the atmosphere; simply because if we attempt to bring down the pressure below that of the surrounding atmosphere, the nature of our retorts is such, that the products of combustion rush in. Admitted, then, that we are compelled, by the nature of our present apparatus, to distil our coal always at atmospheric pressure, not because that by our present exhausters (as "M" seemed to suppose I imagined) we could not produce a vacuum inside our retorts, but that if we did so the said products of combustion would find their way among our gas. I think it must be evident to every thinking mind that, as the atmospheric or barometrical pressure is constantly undergoing alteration, even with the most perfectly arranged exhauster we must be carbonizing under varying pressure. To illustrate what I mean—suppose that, say on Monday, the barometer stands at 30·50 inches, and that in a given work the working pressure, or pressure needed to overcome the friction of the gas passing through the apparatus, and to pass it into the holder, to equal a column of water 13 inches high, it would be only this working pressure that an exhauster could be employed to remove, and, therefore, the pressure on the charge inside the retort would be equal to 30·50 inches of mercury. Suppose, now, that on Tuesday the barometer has fallen to 29·50 inches, and that the working pressure remains the same; but, in this case, instead of the exhauster being used to relieve the working pressure, the by-pass is opened, and the gas evolved from the coal is allowed to overcome the pressure, then the coal would be carbonized under identically similar circumstances to those on Monday; for 29·50 inches of mercury, due to atmospheric pressure, and 13 inches of water (which is, practically, equal to 1 inch of mercury), would give just 30·50 inches of mercury as the pressure under which the coal was distilled. Suppose, again, that on Wednesday the barometer has fallen to 28·50 inches, and still the same working pressure; then, even allowing that no exhauster is employed, the coal would be undergoing distillation at a pressure equal to about a column of water 13 inches less than on Monday, and, in the event of the exhauster being set to work, the pressure under which the coal would be carbonized would be only 28·50, or that of the surrounding atmosphere—or equal to a column of water 26 inches less than on Monday.

For similar reasons, the greater the altitude at which a work is located above sea level, the lower will be the pressure under which the gas-work has to carbonize its coal, from the well-known fact that barometrical pressure diminishes as we ascend. Gas-works placed 450 feet above the sea level will have always less pressure by a column of water 6 inches high, and works 900 feet will have still less by other 6 or 7 inches, or in all, 13 inches less than works located at sea level.

If, therefore, there is any advantage in the use of exhausters, so far as increasing volume and illuminating power are concerned, then we should have far more and better gas when the barometer is low, even in a work without an exhauster, than it is possible to get from the same coal, when the barometer is high, in a work with the most perfect exhausting power possible, with our plant as it at present exists.

For a similar reason, a gas-work located 400 to 900 feet above sea level, and having a working pressure of from 6 to 13 inches, would, without any exhauster, be carbonizing coal under similar pressures to a gas-work located on the sea level, with the most perfect exhauster possible; and further, for the same reason, the higher a gas-work is located above sea level, the larger should be the yield, and the better the illuminating power of the gas, the smaller should be the deposit of carbon, and the seldomer should the stand-pipes choke. I say such *should* be the case if gas exhaustion does modify these results, although I do not say such is the case, for, by the above reasoning, I was led to doubt, and since then I have made many inquiries, as well as many experiments (some of them of a very practical nature), and have not yet quite settled the matter in my mind further than this, that if exhaustion *does* affect these results, it does so to a practically infinitesimal degree, and not at all commensurate with the power expended. From experiments which I have been making on the distillation of coal under very low and very high pressures, I was led to infer that were it possible to relieve the pressure still further, there would be no deposition of carbon on the retorts. I was, therefore, perfectly serious in making the *supposition*, were it possible to relieve the pressure of the atmosphere, so that the coal in the retort would undergo distillation in a *perfect* vacuum, that the deposition of carbon would cease. I was quite aware that, from a variety of reasons, this could not be accomplished, and I, therefore, also stated, quite as seriously, that. practically, it is quite impossible to accomplish this desired object; and, consequently I suggested that we should turn our attention to some other means of removing the nuisance of a deposit. From experiments which are being made by an intimate friend of mine, and at which I have had the pleasure of assisting, I have considerable hope that this desired object will shortly be successfully and profitably attained.

I have only one other remark to make in connexion with gas exhaustion, and I have done. My friend "M." remarks that leaky retorts will *let in* as well as *let out*. They *do;* but with this material difference, that as long as the internal pressure is below that of the surrounding atmosphere, air will pass in, combining with and burning out the carbon, and making the leaks greater; but, on the other hand, where the pressure is greater inside the retort than the surrounding atmosphere, the gases pass out only for a very short time; for, in doing so, they deposit carbon in the passages, and very soon make the retort no longer leaky. A further proof that all that is claimed for gas exhaustion is not gain, and that from my point of view my friend "M." is not correct in stating that the great question of the day is, not the invention of exhausting machinery, *nor yet* whether the power of steam should be, for the sake of economy, exerted through the medium of a steam-engine, or applied directly to the gas in the form of a jet; but rather, whether it is necessary, for the sake of economy, to have an exhauster at all, and whether it is not possible, by modifying our apparatus and mode of manufacture, to much more efficiently and economically accomplish all that is at present being attempted by our exhausters.

It is with considerable diffidence that I lay before your readers these opinions and ideas of mine. Perhaps it would have been as well had I not broached the subject at the meeting of the West of Scotland Association before I was able to go more fully into it; but since I am now committed, as I have already said, I will risk the criticism it may bring upon me; but I do trust that in any further correspondence, correspondents will give their full names and addresses.

WILLIAM DUNLOP.

Corporation Gas-Works, Hamilton, Oct. 20, 1875.

SIR,—It gives me pleasure to reply to the inquiries of your correspondent, Mr. Geo. Anderson, in your last number, as fully as my note-book allows me to do from home-made experiments; although I do not share his partiality for the home-made article—if the object is not merely to satisfy the operator, but to convert the sceptic, and strengthen the faith of the convert.

In the month of April last a trial was made of the steam-jet exhauster, against a back pressure of 23 inches with a vacuum of 1·8 inch, in order to test the cooling power of the steam scrubber, and the strength of the liquor discharged by it, while working against exceptional resistance. During the trial, the steam pressure varied from 73 lbs. to 78 lbs.; but 40 lbs. would have been quite sufficient. The temperature of the gas, at the outlet of the scrubber, was very nearly the same as the outer atmosphere, which was 60 degrees; average strength of liquor from the condensed steam, 6½° Twaddel, or 13 oz. The quantity of water evaporated in the boiler was not measured; but the strength of the liquor shows that it could not have been excessive.

The pale ghost of impoverished gas will continue to frighten the inexperienced from the use of steam-jet exhausters, until it vanishes before the light of knowledge derived from disinterested sources. The writer has long since ceased to pursue the phantom, having years ago arrived at the conclusion that, against any back pressure, the effect is enrichment rather than impoverishment. This conclusion is confirmed, it is believed, by the experience of all who have used these exhausters.

If his distance from Linacre is not too great, Mr. Anderson is heartily invited to come and see the jet in operation, as well as our improved method of condensing and scrubbing, which are its fitting preface and finale. But, perhaps, he will prefer to wait the result of trials in London

and its neighbourhood, where several jet-exhausters and steam-scrubbers are at work, or in process of erection.

While I have pen in hand, allow me a few words of criticism on the letter of your correspondent, Mr. R. H. Patterson, which appears in the same issue.

It appears to me, to whatever part of our apparatus through which gas is passing we attach a gauge, if we find pressure there, we have a propelling action. If we find vacuum, then we have a sucking or exhausting action. If the gas were discharged from the outlet of an exhauster immediately into a gasholder balanced to zero, propulsion would practically be abolished, yet the exhauster would be doing its proper work of exhausting, drawing, or sucking the gas from the hydraulic main. I see no need to forbid the familiar name, derived, say the scholars, from *ex* and *haurio*, to draw, and to re-christen the apparatus "propeller." from *pro*, forward, and *pello*, to drive; drawing, not driving, being in fact its primary use.

If the president of the "West of Scotland Association of Gas Managers" were to explain what he meant to convey to his hearers, perhaps he would be found not to be so very far at sea as he appears. He has given us, however, a striking illustration of the need of exact language in treating such subjects.

WILLIAM CLELAND.

The Liverpool United Gaslight Company, Linacre, Oct. 22, 1875.

SIR,—There was one reason for the adoption of the term "Exhausters" when they were first introduced, which Mr. Patterson has not noticed, and that, perhaps, was just enough to have given them the name; I mean the dip in the hydraulic main, which in those days was seldom less (often more) than 3 inches. Hence a certain amount of exhaustion was necessary to neutralize the effect of this resistance, say an exhaustion of 3 inches, leaving half an inch of pressure in the retort. After this the machine is really an abutment to the load produced by friction and the weight of the gasholders. I agree with Mr. Patterson, that the longer this infant—*exhaustion*—is coming to maturity the better, if it is to be employed to form a vacuum in clay retorts.

M.

STATION-METERS WITHOUT CASES.

SIR,—I have read with some interest the correspondence which has appeared in the JOURNAL, during the last few weeks, on the subject of "Station-Meters without Cases," and as it appeared that your correspondents believed that the lower part of the case was absolutely necessary, I was led to investigate the subject, and to see how far that statement was correct, and I have come to the conclusion that the lower part of the case is *not* indispensable. The arrangement I would adopt to render the whole of the case unnecessary is this:—Instead of the ordinary shaft, on which the drum of a meter works, a hollow one must be provided, upon which the drum will revolve freely. This shaft must be of a size sufficient to pass the quantity of gas required by the meter. A second hood must be fitted upon the outlet end of the drum, and upon the centre of each hood must be fixed a stuffing-box to fit the hollow shaft, which must be accurately turned where it works in the stuffing-boxes, so as to cause the least possible amount of friction. The inlet and outlet pipes are to be carried up from the shaft, one on each side of the drum, between the drum and the hood, to the height of the intended water-line. The water supply can be effected by means of a small pipe running up the inlet-pipe from the shaft, and the waste water can run away down the outlet-pipe and be removed by a syphon-box. It will be evident that the shaft must be filled up in the centre between the inlet and outlet pipes, otherwise the gas will pass straight through without entering the drum. This plan certainly does away with the necessity for a case, and is not open to the objection met with by Mr. Hartley, in his experimants with half a case, with regard to the water-line varying with every variation of pressure. I have not patented the system, so that Mr. Micawber is quite at liberty to make what use of it he pleases. I have no doubt his own ingenuity will supply the means for fixing the index, and also for fixing the shaft.

J. T.

DISPUTED GAS ACCOUNTS.

SIR,—In this week's number of the JOURNAL I notice a decision given in the Huddersfield County Court, which, I think, deserves some consideration, as it might go to form what I venture to think would be a somewhat dangerous precedent.

It would seem that a consumer had refused payment of his account for gas, as indicated by the meter, on the ground of increased quantity as compared with corresponding periods of previous years, and this sudden increase being considered as *primâ facie* evidence of the incorrectness of the meter, the defendant obtained a verdict in his favour.

In my experience, when a dispute occurs I invariably abide by the registration of the meter, and inquire into the cause of excess—which, I must say, is generally found to be, not in the meter, but beyond it, and, therefore, at the risk and under the control of the consumer.

Further information on this case is, I think, much to be desired.

Oct. 22, 1875.

N. B.

DUNDEE GAS-WORKS.

SIR,—A good deal has been said and written, "north the Tweed," in regard to the merits of Messrs. Malam and Scott's systems of manufacturing gas. Without entering into the conflicting statements that have been brought forward as to their practical value, allow me to call the attention of gas managers to a work in which the yield of gas per ton is considerably above the average—I refer to the very successful management of Mr. Macrae of the Dundee Gas-Works. Without going farther back than the JOURNAL OF GAS LIGHTING of the 7th of September, I observe a paragraph giving the amount of coal carbonized, during the month of July, as 732 tons 6 cwt., and the gas made as 8,255,500 cubic feet, or an average of fully 11,200 feet per ton. Again, in the JOURNAL of the 12th of October, another statement appears, giving a return of 11,500 cubic feet per ton of coal carbonized, or about 1000 feet above the average of most gas-works in Scotland. At one of the gas managers meetings held lately, it was hinted that Mr. Macrae's successful management was due to the practice of putting in light charges. No doubt this practice is to be commended, but I fear it will scarcely account for the results above referred to.

Perhaps, were some of the gas managers associations to ask Mr. Macrae to give a paper at one of their meetings, explaining the construction of his ovens, size of retorts, weight of charges, &c., &c., it might prove of advantage to many besides

AN OLD GAS MANAGER.

Legal Intelligence.

SOUTHAMPTON COUNTY COURT.—MONDAY, OCT. 18.

(*Before Mr.* P. M. LEONARD, *Judge, and a Jury.*)

ACTION TO RECOVER GAS-RENT IN DISPUTE.

The Southampton Gaslight and Coke Company, the plaintiffs, were represented by Mr. STOCKEN; *James Ireland*, the defendant, a draper, of Hanover Buildings, was represented by Mr. KILLBY. The action was brought to recover the amount of two quarters supply of gas, the first ending the 25th of March, and the second ending the 30th of June. The first was the amount actually in dispute.

Mr. STOCKEN was proceeding to open his case, when Mr. KILLBY objected to the particulars, the number of cubic feet consumed not being stated.

His HONOUR said he thought the case had better proceed.

Mr. STOCKEN quoted from a letter received from Mr. Killby, in which he offered £4 7s. 10d. on behalf of his client in satisfaction of the claim for gas consumed for the first-mentioned quarter, but said, as a contract entered into the question, it would be simply one of law for his honour to decide; while as to the second quarter, he should call the inspector, who would prove the amount of gas consumed. The item for the first quarter was for gas as per contract, dated Aug. 15, 1871, under the hand of the defendant, who made the usual written application to the company for the supply of gas, and which was subject to the conditions and regulations of the company, these providing that in the event of the meter ceasing to register, notice thereof was to be given at the office, when a new one would be forwarded, and the charge then made for gas would be proportionate to that of the corresponding quarter of the previous year.

Evidence having been given, in the course of which the proceedings before the magistrates were incidentally mentioned, where a penalty of £12 had been imposed upon the company for neglecting to supply defendant with gas, he having taken proceedings against them for cutting off the supply, and in regard to which an appeal by the company is now pending, a copy of the regulations was handed to his honour, and it was submitted by Mr. Stocken that as Mr. Ireland had consumed gas upon those terms, it was simply a question as to what was the amount consumed during the corresponding quarter of the previous year.

Mr. *C. C. Smith*, secretary of the company, stated that the meter supplied to defendant failed to register from the 23rd of December, 1874, until the 3rd of March, 1875, when a new meter was put upon the premises, which registered for 21 days, during which 7800 cubic feet of gas were consumed. In consequence of this failure of the meter to register, the company made up the amount charged to that of the corresponding quarter of last year, by adding 21,000 cubic feet, making 28,800, the consumption in the previous year. This was the usual course, and was not objected to by consumers.

Mr. *Noble*, one of the company's inspectors, proved the quantity of gas consumed in the corresponding quarter referred to.

Mr. KILLBY, who addressed the court for the defence at considerable length, said his first objection was that the company had no power to make the regulations they had, and then that they formed no part of the contract whatever. The company's private Act gave them no power to make any regulations, and although the Lands Clauses Consolidation Act did, they must be reasonable regulations, and further sanctioned by the seal of the company, in order to indicate that they had been passed in a proper manner, and were in compliance with the provisions of the Act. In this case there was nothing of the sort whatever, and if what had been done was to be allowed to hold good, the company could make any regulations they liked, however unreasonable and absurd. The defendant was quite ready to pay for the quantity of gas he had consumed, but he objected to have these conditions forced down his throat because the company could not state the number of cubic feet of gas burnt. By the Gas-Works Clauses Amendment Act of 1871, regulating all gas companies, it was provided that, whenever a dispute occurred between the consumer and the undertakers, it should be determined by the application of either party to two justices, whose decision should be final, who should order which side should pay the costs; and it was only when the amount due was thus settled that recourse could be had to the county court. This provision contemplated, he urged, the exact state of things now before the court, and it was, too, the most reasonable course to pursue; for under that now adopted a man who had his house of business empty for one quarter, and hardly used gas at all, would have, perhaps, to submit to the injustice of paying the same amount as for a corresponding quarter, when he used an immense quantity of gas. To prove that the Act of 1871, containing the provision referred to, applied to the Southampton Gas Company, he quoted the case of *The Commercial Gas Company v. Scott*, wherein Mr. Justice Lush and another judge clearly laid down, he submitted, that the Act applied to all existing undertakings, and not merely to those established since it was passed. He also quoted *Mather v. The New River Company*, being a dispute as to the amount at which a person's house should be assessed for the supply of water to him, and wherein the court held that the justices, and not the county court judge, should have decided the point.

His HONOUR: But there the matter turned upon a rate, and the judge clearly had no power.

Mr. STOCKEN said that there was an express provision in the gas company's Act, giving the power to do what they had, for sect. 40 said: "Nothing in this Act, or any Act incorporated herewith, contained shall prevent the company recovering any sum of money, to the extent of £50, due to them for the supply of gas, coke, &c., in such manner as is by law provided for the recovery of debts not exceeding £50."

Mr. KILLBY contended that this section did not apply to the present case, where the amount due was in dispute.

His HONOUR said he thought the question decided in the case quoted was whether the Act applied to the Commercial Company. He did not think it governed the one before him.

Mr. KILLBY said the only other question was whether his honour agreed with him that the company had no power to make these regulations.

His HONOUR upon this point also ruled against Mr. Killby, saying it was, to any person of common sense, reasonable that the company should make such regulations, and it was perfectly clear, from a letter of the defendant's which had been put in, that he was aware of their existence.

Mr. KILLBY then addressed the jury upon the facts, urging that his client had taken all proper means within his power to arrive at a proper settlement, he having made a legal tender at the company's office of the amount due for the second quarter, about which there was no mistake, as well as a sum which he considered fair for the first quarter, being the amount charged for in the previous instead of the corresponding quarter. He commented upon the wording of the regulations, which, he pointed out, did not say the corresponding quarter of the previous year, but only the corresponding quarter; and it was equally reasonable, he submitted, therefore, to apply it to the corresponding quarter of any previous year they liked to select.

The *defendant* was then called, and referred to correspondence and conversations which had taken place between himself and Mr. Durkin, the company's manager, wherein he had stated his refusal to pay the sum demanded of him, he having almost refrained from using a gas-stove which was brought largely into requisition in the previous corresponding quarter. He tendered £4 7s. 10d., but his cheque was returned with the threat that if the other amount was not paid his gas supply would be cut off, and this was subsequently done.

Mr. J. S. ELDRIDGE (magistrates clerk) produced the information laid by

Mr. Ireland against the company before the magistrates, with the view of getting the sum due fixed by them.

Mr. KILLBY said the object of this was to show the *bona fides* of the defendant.

His HONOUR summed up the case to the jury, saying it would be for them to decide whether there was gas consumed by defendant in the first quarter to the mount claimed by the company; and if they came to the conclusion that there was, there was no dispute as to the other quarter's charge. It was, however, a matter of observation to them that in the charge for the second of the two quarters there was but little difference. The defendant, as a consumer, was governed by the company's regulations.

The JURY consulted, and returned a verdict that the amount claimed was due to the gas company.

Mr. STOCKEN thereupon asked his honour to give him a certificate for full costs, which Mr. KILLBY opposed.

His HONOUR said he was governed by the County Court Act, and could only give those thus allowed.

Subsequently Mr. Killby applied for a case, first upon the construction of the regulations, and then upon the general facts of the case, but his honour refused to grant it.

WEST BROMWICH POLICE COURT.—SATURDAY, OCT. 16.

(*Before Messrs.* ADKINS *and* KENDRICK.)

ALLEGED DEFICIENT WATER SUPPLY.

The South Staffordshire Water-Works Company were summoned, at the instance of the Smethwick Local Board, for neglecting to supply a proper quantity of water to the Smethwick district on two occasions.

Mr. DOCKER, clerk to the board, who appeared on behalf of the complainants, said his compliant was that the company omitted to furnish Smethwick with a proper supply of water on the 28th and 31st of August. Similar complaints had been brought before the bench, and on each occasion the defendants had excused themselves by saying that the machinery was out of order.

Samuel Lloyd, the foreman of the highways, stated that for the purpose of watering the roads at Smethwick, on the 28th of August, he went to the hydrant in Green Street; as there was no water there, he went to the hydrant in Windmill Street, where it took 25 minutes to fill the water-cart, instead of eight minutes. He was also unable to obtain any water in Queen Street. The same difficulty was experienced on the 31st of August.

Mr. WAINWRIGHT, who appeared for the company, admitted their liability to supply water under pressure, and, as a rule, they gave that supply. On the 28th of August, however, the company were executing some repairs which were absolutely necessary, and it was in consequence of those repairs that the Smethwick Commissioners were deprived of water. On the second occasion some inconvenience had arisen with the company's pipes, which compelled the engine to be worked at a reduced speed, and during that inconvenience the deficiency had occurred.

Mr. *Vaudrey*, the engineer of the company, stated that it had been in contemplation to make fresh contrivances for the Smethwick district, and the intentions would have been carried out if the necessary pipes could have been obtained according to promise.

Under those circumstances, and upon the suggestion of the bench, Mr. DOCKER withdrew his complaint; the defendants to pay costs.

WANDSWORTH POLICE COURT.—WEDNESDAY, OCT. 20.

(*Before Mr.* INGHAM.)

DISPUTED GAS ACCOUNT.

Mr. *G. Lewis*, fishmonger, was summoned by the Wandsworth and Putney Gaslight Company for the non-payment of a claim for the supply of gas to his premises.

Mr. JONES, who appeared in support of the summons, said the company only wished to establish their right in the matter in dispute, and not to be hard upon the defendant. The supply of gas to the defendant's premises was made through his own meter, and not one supplied to him by the company. According to the agreement the defendant entered into with the company, he was liable to pay for the consumption indicated by the meter, and it was provided that if from any cause the meter ceased to register, the consumption of gas for the corresponding quarter of the previous year was to be taken as indicating the actual consumption of the quarter in question. The charge for the corresponding quarter of the previous year was £1 13s. 9d. The register of the defendant's meter was taken in the usual way for the quarter ending September, 1874, and it was taken again at the quarter ending December of the same year, when it was found that the index had not moved since the previous examination. At defendant's own request the meter had been tested for him by the inspector, who certified it to be correct. After being so certified it appeared to have gone a few hundred feet, and then stopped altogether.

Defendant contended that he was only bound to pay for the quantity indicated by the meter to have been consumed, and the meter had been previously examined by the meter inspector, and found to be correct.

Mr. INGHAM held that that was no excuse for non-payment of the company's demand, as defendant was liable, upon his agreement, to pay according to the consumption of the corresponding quarter of the last year, in the event of the meter not registering from any cause. The defendant was charged for the quarter £1 13s. 9d., which, with a balance due from Lady Day of 9s. 2d., made up the company's claim to £2 2s. 11d., against which they held a deposit of £1. The order was made for £1 4s. 11d., being the balance and 2s. costs, the magistrate remarking that defendant had been let off very easily.

SEWERAGE AND WATER SUPPLY OF RIPLEY.—At a meeting of the Local Board, on the 14th inst., plans were submitted for the sewerage of the district, under the jurisdiction of the board, and also for water supply. The estimated cost of the former is £10,000, and of the latter £9000. The plans were ordered to be submitted to the Local Government Board in London for approval. The sewerage scheme embraces land for a sewage farm and gardens; the water scheme embraces the entire project of bringing a good supply to all the inhabitants.

POLICE LAMP EXTINGUISHERS.—At the meeting of the Aberdeen Town Council on the 18th inst., a letter was read from the Government Inspector of Police for Scotland, stating that on his last visit to Aberdeen he found that the constables on duty during the night had to extinguish the public lamps; that this work was not a police duty: and that if the men were not relieved of the work he would report those so employed as inefficient, with the probable result that the whole of the Government grant would be disallowed, and the certain result that the grant would not be given for the men reported inefficient. On the motion of the Lord Provost, the letter was remitted to the Watching and Lighting Committee. The Provost remarked that this was a heavy penalty to be imposed for a small offence. The police in Aberdeen had turned off the gas in the public lamps from time immemorial, he might say, and he thought it was rather an enjoyment to the men to do so, seeing that it broke the even tenor of their way, and relieved them of the irksome monotony of their nightly rounds. Generally they had nothing to do, and he thought they would be glad of some little thing to employ themselves at in order to stir them into life. He supposed, however, that the council had no help but to comply with the Government Inspector's request and get the lamplighters to rise in the morning and put out the lights.

Miscellaneous News.

SHEFFIELD UNITED GAS COMPANY.

The Half-Yearly Ordinary Meeting of Shareholders was held in the Cutlers Hall, Sheffield, on Monday, Oct. 18—F. T. MAPPIN, Esq., in the chair.

The LAW-CLERK (Mr. Wake) read the following report:—

The directors have pleasure in presenting their accounts for the half year ending the 30th of June last, during which period a net profit has been made of more than sufficient to pay the maximum dividend.

The profit has been £22,517 1s. 1d.

The maximum dividend will be as under:—

Dividend on £135,000 class A stock, after the rate of £10 per cent. per annum	£6,750 0 0
Dividend on £209,053 10s. class B stock, after the rate of £10 per cent. per annum	10,452 13 6
Dividend on £99,700 class C stock, after the rate of 7¼ per centum per annum	3,738 15 0
Dividend on 12,937 new ordinary £10 shares (£2 per share paid up), being after the rate of 7½ per centum per annum, or 1s. 6d. per share	970 5 6
Total	£21,911 14 0

There will remain a surplus of £605 7s. 1d. to add to the reserve-fund, which fund will then amount to £38,353 3s. 6d.

The board took possession of the new offices and show rooms shortly after the last meeting of the shareholders, and the removal from the old inconvenient premises in Shude Hill to the new ones in Commercial Street, has been a great convenience not only to the company's staff but to its very numerous customers.

Your board have recently commenced the making of a large gasholder-tank at Neepsend, the increase in the consumption of gas rendering it necessary to extend the storeage at those works.

The three directors who retire by rotation are Mr. Charles Hoole, Mr. Ebenezer Hall, and Mr. Samuel Parker; they are eligible, and offer themselves for re-election.

Capital Account, for the Half Year ending June 30, 1875.—Dr.

	Dec. 31, 1874.	June 30, 1875.	Total.
Class A stock, fully paid up	£135,000 0 0	.. ..	£135,000 0 0
Ditto B ditto ditto	209,053 10 0	.. ..	209,053 10 0
Ditto C ditto ditto	99,700 0 0	.. ..	99,700 0 0
12,937 new ord. £10 shares (2nd issue), £2 per share paid up	25,874 0 0	.. ..	25,874 0 0
Amount raised on mortgage	19,400 0 0	£600 0 0	20,000 0 0
			£489,627 10 0
Balance			6,435 10 10
			£496,063 0 10

Capital Account, for the Half Year ending June 30, 1875.—Cr.

	Dec. 31, 1874.	June 30, 1875.	Total.
Land, buildings, parliamentary, and other expenses, works, and machinery (including mains to June 30, 1855)	£398,302 0 1	£6,433 4 1	£404,735 4 2
Mains from June 30, 1855	63,191 19 9	1,169 0 3	64,361 0 0
Meters	26,540 3 8	426 13 0	26,966 16 8
			£496,063 0 10

Dr. *Revenue Account, June 30, 1875.* *Cr.*

Half year's gas, meter, and other rents, due this day, including amount arising from the sale of coke, tar, waste lime, ammonia water, gas-fittings, and work done	£80,211 10 8	Half year's expenditure in the production of gas	£38,584 15 2
Amount realized from the sale of second issue of forfeited new ordinary £10 shares	1,378 6 0	Paid mortgagees & bankers for interest during the half year	488 0 5
		Balance	22,517 1 1
	£81,589 16 8		£81,589 16 8
Balance brought down	£22,517 1 1	Dividends payable Nov. 1, 1875	£21,911 14 0
		Balance to be carried to reserve-fund, Nov. 1, 1875	605 7 1
	£22,517 1 1		£22,517 1 1

Maximum price of gas, 3s. 1d. per 1000 feet.

General Balance.

Balance of revenue account	£22,517 1 1	Ledger balances, and accounts owing to the company	£32,458 0 0½
Ledger balances, and accounts owing by the company	41,566 3 10½	Stores in hand	19,886 4 9
		Balance of capital account	6,435 10 10
		Balance due from bankers	5,299 17 0
		Balance due from cashier	3 12 4
	£64,083 4 11½		£64,083 4 11½
Reserve-fund, invested Dec. 31, 1874			£37,221 9 0
Amount transferred to revenue, May 1, 1875			268 9 0
			£36,953 0 0
Interest to June 30, 1875			794 16 5
			£37,747 16 5

The CHAIRMAN, in moving the adoption of the report, congratulated the shareholders on being able to pay the maximum dividend without intrenching upon the reserve-fund. They might also congratulate themselves upon the satisfactory position in which the company was at the present time. This no doubt was due to some extent to the reduced cost of coals, and it would perhaps interest the shareholders to know that during the past half year they had paid for coal £2848 less than in the corresponding half of last year. At the same time it must be remembered that although they had paid less for coal, they had received less for coke; and the difference in one direction was more than made up by the difference in the other, as the receipts for coke were £3408 less than in the corresponding half of last year. The company no doubt had made more gas, for which they had received pretty nearly £3000, and he was sure they might congratulate themselves in this respect. The company were about extending their mains to Oughtibridge, and had lately purchased the works of the company which formerly supplied the place. The consumers there would be benefited by having a superior article at a less price—viz., at the same price as in Sheffield, 3s. 1d. per 1000 feet. The directors had expended upon capital account during the past half year a little more than £8000. As they would remember, they gave powers to their directors to raise £20,000 on mortgage, and after that had been all borrowed, he thought it would necessitate the directors making a call upon the new shares. This call, although not yet decided upon, was known to the directors and the manager, and he thought it very likely that it would be made before the next meeting. Therefore he expected it would be satisfactory to the shareholders to know of it. The directors had also let a contract for a new gasholder upon an entirely new principle which the South Metropolitan Gas Company had tried with very satisfactory results, and which had saved that company something like £6000. They said at the same time that the efficiency and the durability were in no way diminished. The engineer to the Sheffield Company had examined the system, and he had every confidence in it; and therefore the directors had adopted his suggestion. Before

concluding, he might say that the price they were paying for coals prevented them saying exactly when they would be able to reduce the price of gas to 3s.; but should they be in the position to do so, he was sure the directors would take the earliest opportunity; but at the present time they could not quite see their way to it.

Mr. W. WATSON, in seconding the motion, said he thought the shareholders were very much indebted to the board of directors for having laid before them a statement of accounts so satisfactory as to realize the maximum dividend without intrenching upon the surplus funds. The difficulties they had had to contend with as to the high price of coal and labour must have required a good deal of judgment and business management to surmount. The chairman had made some reference to a proposed call, and he was sure he need not say that the shareholders left it implicitly in the hands of the directors to make the call when they felt they needed the money. He congratulated the shareholders upon the position which the company held, and he thought they might also congratulate themselves upon having such a chairman and such a board of directors. They were all gentlemen of standing and business habits, and he was sure the interests of the shareholders were safe in their hands.

Mr. SISSONS said he wanted to know something about the new offices. From the absence of any statement in the accounts, he assumed that the magnificent buildings which had recently been opened had been presented to the company by some generous individual. There was no information in the report as to the cost of the building, or as to where the money came from. Some of the cost, no doubt, would be defrayed by the interchange of land with the Midland Company; but still something should have been mentioned in the report about so important a matter. He should also like to know how it was the price of gas at Oughtibridge was more than at Sheffield, but he wished for some particulars concerning the new building, as the shareholders desired to act in a straightforward manner, and the directors should do so too.

The CHAIRMAN said that in his opening remarks he had stated that the directors had expended £8028 during the past half year, which included the sums they had paid during the past half year at various times for the new building.

Mr. SISSONS: Where have you got the money?

The CHAIRMAN: You gave us power to borrow £20,000.

The report was then passed, and the usual maximum dividend having been declared, and the retiring directors reappointed, the proceedings concluded.

WOLVERHAMPTON GAS COMPANY.

An Extraordinary Meeting of Shareholders was held at the company's offices on the 13th inst.—Mr. J. UNDERHILL in the chair—for the purpose of authorizing the company to raise additional capital, to an amount not exceeding in the whole the sum of £49,480, by the creation and issue of new ordinary or preference shares of the nominal value of £5 each, and as to the apportionment of the whole or any part of such shares among the proprietors, and otherwise as to the disposal of such shares.

The SECRETARY (Mr. A. Jones) having read the notice convening the meeting,

The CHAIRMAN explained its object. The shareholders, he said, were aware that the directors had obtained a Provisional Order from the Board of Trade, empowering them to create new capital to the extent of £49,480, just half their present capital. It was proposed to raise the new capital in £5 shares, and to first apportion them amongst the present shareholders, by allowing one share to every £10 worth of stock held by them. If the resolutions were passed, each shareholder would have to signify his intention of accepting the allotment within one month after receiving the notice from the secretary, who would send each shareholder a printed form. Those who intimated their intention of taking up the new capital would have to make the first deposit on the 1st of January next, and the directors would make the future calls as they required the money; but no call would exceed £1 per share, and three months, at the least, must elapse between each call. The resolutions, which would be submitted to the meeting, would detail the mode in which the new capital would be issued.

The SOLICITOR (Mr. Manby) then read the formal resolutions for carrying out the proposed object, and

The CHAIRMAN moved their adoption.

Mr. WARNER seconded the motion.

Mr. WARD asked to be informed why the new capital was made preference instead of ordinary shares.

The CHAIRMAN replied that it was well known that when the directors were applying for the Board of Trade Provisional Order to create the new capital, it was mentioned that the corporation would probably have something to say on the matter, and that they might raise some opposition to the company's proposal. However, a deputation from the corporation met the directors, and it was eventually decided amicably between the two parties that, instead of the directors going for a 7 per cent. dividend, and taking the chance of getting the 7 per cent. upon ordinary stock, that they should take 6 per cent. guaranteed upon the preference stock. Therefore it was upon that foundation that the directors proceeded, and the result was that they had had no opposition either from the Board of Trade or the corporation. They had been able to conduct the negotiations in the most friendly manner, and they had secured the 6 per cent. guaranteed without risking an opposition, which might have been the case if they had applied for 7 per cent.

Mr. IRONMONGER said there was a general desire that the whole matter should be done so as to avoid, if possible, any opposition from the corporation, or from the town generally.

The CHAIRMAN then put the resolutions to the meeting, and they were unanimously agreed to, and after a vote of thanks to the chairman, the proceedings terminated.

SWANSEA GASLIGHT COMPANY.

The Twenty-ninth Half-Yearly Ordinary Meeting of Shareholders was held at the Office of the Company on Friday, Oct. 15—THOMAS PHILLIPS, Esq., chairman of the board of directors, presiding. There was a large attendance of shareholders.

The SECRETARY (Mr. Thornton Andrews) read the notice convening the meeting, the seal of the company was affixed to the register, and the minutes of proceedings at the annual meeting on April 16 last were read and confirmed.

The following report was then submitted:—

The directors, in laying before the shareholders the report and accounts for the half year ending the 30th of June, 1875, cannot but express their satisfaction at the reduction in the price of coal that has taken place since May, 1875. Anxious to meet the wishes of the consumers as regards the price of gas, your directors have already determined upon a reduction from the 1st of October, and, subject to the confirmation of the shareholders, recommend a further reduction on and from the 1st of January next.

Your directors trust that with the increased consumption of gas, which they hope for as consequent on the reduction in the price of gas, the improved machinery and appliances which have been provided at the works, and by the exercise of the greatest care and economy in working, together with the maintenance of the present low price of coals, they will be enabled at no distant period to make up the great loss which such reductions must inevitably cause.

The whole of the new apparatus is now completed and at work, consisting of new engines, boilers, exhausters, condensers, scrubbers, and purifiers, together with the necessary buildings substantially constructed; also several miles of new mains laid to improve the lighting of the districts, all being adapted and competent to meet the growing requirements of the borough for several years.

In order to meet the heavy outlay necessary for these extensions, your directors recommend to you to grant them the requisite authority at this meeting to create and issue 400 new shares, at such periods as they may deem advisable.

Your directors are glad to be able to recommend the payment for the past half year of the full dividends—namely, 10 per cent. per annum on the £6000 original capital, and 7½ per cent. per annum on the £68,250 new capital, which will absorb £2859 7s. 6d., leaving a small balance of £24 4s. 9d. to be carried forward to the next half year.

It was then resolved—"That the report and accounts for the half year ending June 30, 1875, now presented and read, be received and adopted, and entered on the minute-book of the company."

A resolution, declaring the dividends recommended in the report, and a further resolution, authorizing the directors to create and issue 400 new shares, were also adopted.

The general business of the company having been disposed of,

The CHAIRMAN said that every shareholder present must have been aware that for a considerable time the town had been agitated by the question of "cheap gas," which agitation had been supported by one of the "local prints" in such a way as to make it a purely personal question. He was happy to say that no real grievance existed, for the directors and shareholders had been ever mindful of their duty to the public by charging a reasonably low rate for gas, consistent with the cost of raw materials and labour, and the duties they owed to the shareholders and the public. They had, moreover, when the opportunity had arisen, always voluntarily, and without any pressure from without, reduced the cost of gas to as low a rate as was consistent with the earning of the statutory dividend. They were told outside that they received 10 per cent. and 7½ per cent. for their money. True, they received 10 per cent. on £6000, and 7½ per cent. on £68,250; but in the latter case the shares were bought at £34 10s. per share, which really made the dividend to the purchasers only 5¼ to 5½ per cent. on their investment. The public had the advantage of these premiums, for they went in the enlargement and improvement of the works without bearing any interest. Consequent upon the agitation for cheap gas, the corporation appointed a deputation of the council to wait on the directors of the gas company, with a view to arrange a reduction of price to the public and private consumer. The deputation consisted of the Mayor, Messrs. J. J. Jenkins, Dr. Rogers, Capt. Ford, J. J. Evans, town-clerk and borough surveyor, and he was glad to say that the interview had resulted in the very best manner for all parties concerned. He was glad to say that the most perfect understanding prevailed, and the deputation appeared to be thoroughly satisfied with the endeavours the company had made, in the erection of extensive new works, to keep pace with the growing requirements of the town. He (as chairman) had promised the mayor that the question of reduction in price of gas should be submitted to the meeting of shareholders; that all information should be furnished them, so that the resolution, coming from the body of shareholders, should be their vote, and not that of the directors. It required a certain price to pay the necessary dividends, and if the shareholders believed that the price to the consumers should be below that minimum, then they must forego their ordinary 7½ per cent. dividend, and be content with something like 5 per cent., or even 4 per cent. But with coal at present price, and great economy, the directors considered a reduction could be made with safety, and with the hope that a great increase in consumption would result, and help to make up the deficiency caused by the reduction.

After some considerable discussion on the question of price of gas, it was moved by Mr. W. STONE, seconded by Mr. PHILIP PRICE, and resolved—"That the gas company will be prepared to enter into a contract for the supply of gas to the Urban Sanitary Authority for a period of three years from the 1st of January next, at the price of 3s. 3d. per 1000 feet, being a further reduction of 3d. per 1000 feet on present price. And that the cost for lighting, cleaning, extinguishing, painting, and repairs be reduced from 22s. 4d. to 18s. per lamp per annum."

It was also moved by Alderman POWELL, seconded by Mr. D. ROSSAR, and resolved—"That the price of gas to the private consumers in the town of Swansea be reduced to 3s. 6d. per 1000 feet, from and after the 1st of January next."

The usual votes of thanks of the shareholders were given to the chairman and directors and to the auditors for their services to the company; as also a vote of thanks to the manager, Mr. Thornton Andrews, for his management of the works during the past year. A graceful compliment was paid to Mr. Andrews by the proposer, for the anxious time he must have undergone during the last three years, in carrying out the large undertakings which the shareholders had that day seen perfected.

The shareholders inspected the works and alteration carried out, and expressed themselves highly satisfied therewith.

DARLINGTON IN DARKNESS.—It was reported from Darlington, on Thursday last, that early in the morning the river Skerne overflowed its banks, and besides covering the surrounding country for some miles, flooded several streets in Darlington to a depth of from 1 to 3 feet. The flood has not been so high for a generation. The fires at the gas-works and at some factories were put out, and operations stopped. Notice was given that there would be no gas, and the streets were consequently in darkness.

SUFFOCATION BY GAS AT RAMSBOTTOM.—The *Manchester Examiner* of Tuesday last states that a discovery of a very painful nature was made at Nuttall Lane, near Ramsbottom, on Sunday afternoon, the 17th inst. In one of the back-to-back cottages known as Brick Row, there lived Michael O'Donnell, a mill operative, and his wife Nancy, both of them turned 60 years of age. They were observed to be stirring about the house between 10 and 11 o'clock on Saturday night, and nothing further was seen of them alive. As is usual in cottages of that description, the front door forms the only ordinary means of ingress and egress, and it was noticed by the neighbours on Sunday that the door was never opened, and that nobody appeared to be astir within. Eventually the door was tried and found to be fastened, and it being feared that some ill had befallen the occupants, one of the neighbours gave an alarm to the village constables, who visited the cottage about five o'clock in the afternoon and forced the door. Immediately the door was thrown ajar, the presence of gas asserted itself with a stifling effect. Nothing was to be seen of O'Donnell and his wife downstairs, and the constables made search above. In the small back bedroom they found the unfortunate couple lying dead. There was every indication that they had died without a struggle. Dr. Wilson was in attendance shortly afterwards, and found all the evidences of death from asphyxia, caused by gas, which filled every part of the house. A kitten was found in the house, but none the worse. On the police-constables making an examination, they soon arrived at the secret of the calamity. Beneath the staircase in the kitchen there had stood a gas-meter, but it had been detached some time ago (O'Donnell not using gas), and the supply-pipe, which was over half an inch in diameter in that part, had been stopped with a plug. It was found that the plug had come out, and the gas was escaping, and thus it was that the rooms above had been filled with the noxious fumes by which O'Donnell and his wife were overcome.—From the *Bury Guardian* we learn that the service-pipe to the meter was carried into a cupboard used for the storage of wood and coal. When the gas was cut off, about 15 months ago, the end of the pipe was plugged, but from some accident or other a fracture had been made in the pipe about 12 inches from the end. This fracture, when O'Donnell took possession of the premises, he stopped with putty. During the last fortnight persons calling at the house had observed a very strong smell of gas, but no complaints were sent to the company on the subject. In fact, a juryman stated that when O'Donnell was spoken to about the leakage he carelessly replied, "Never mind; it's not my loss." An inquest has been held at which the jury returned a verdict "That the deceased were found dead in bed, and the probable cause of their death was suffocation by an accidental escape of gas."

MANCHESTER CORPORATION GAS-WORKS.

Report of the Gas Committee for the Year ending June 24, 1875.

The Gas Committee present the following report:—

Your committee submit an abstract of the accounts of the gas department for the year ending June 24, 1875, and also the usual tabular and explanatory statements.

Appendix A shows the amount of lamp and private rental derived from the townships within and beyond the city respectively for the past two years.

Appendix B, the quantity of gas transmitted from the works in the daytime, and during the whole 24 hours of the day in each month, for the same period.

Appendix C, the number of meters in use on the 24th of June, 1874 and 1875 respectively.

Appendix D, the length and sizes of main-pipes laid and taken up during the year, and also the total now in use.

Appendix E, the amount of profit and the mode of its appropriation, the amount of borrowed money owing, and the excess of assets, &c., in each year from 1862 to the 24th of June last.

The rental for the past year (including meter-rents) has amounted to the sum of £326,106 3s. 8d., being an increase of £30,105 11s. 1d.

The profit is £106,807 6s. 5d., as against £77,465 12s. 2d. in the previous year, and is appropriated as follows:—Interest on loans, £17,182 18s. 8d.; set aside and transferred to capital account towards liquidation of the mortgage debt, £28,514 17s. 11d.; portion of surplus payable to the improvement department, £35,257 2s. 1d.; and reserved by your committee towards repayment of advances made to the improvement department, in anticipation of profits, in accordance with the arrangement sanctioned by the council on the 4th of March, 1868, £25,852 7s. 9d., and leaving still owing, as part of such advances, £26,457 10s. 3d.

The number of consumers has increased 2 per cent., amounting now to 67,343, as against 65,979 the previous year.

The quantity of gas supplied has amounted to 1,878,391,000 cubic feet, being an increase of 99,934,000, or 4·38 per cent. over the previous year.

Your committee submit the report of Mr. John Leigh, the consulting and analytical chemist to this department, with regard to the purity and illuminating power of the gas during the past year, and also the report of Messrs. S. E. Cottam and Son, the auditors appointed by the council, in reference to the accounts of this department.

"*To the Chairman of the Gas Committee.*

"*Officer of Health's Department, Town-Hall, Manchester, Oct.* 2, 1875.

"Sir,—I have the honour to report to you that the average illuminating power of the Manchester gas during the past year has been equal to that of 18·53 London standard candles.

"The gas has been tested photometrically at the Gaythorn and at the Rochdale Road stations almost daily. The standard of comparison adopted has been the light of a London standard sperm candle burning at the rate of 120 grains per hour, the consumption of the gas having been reduced to 5 cubic feet per hour.

"The gas has been tested daily for sulphuretted hydrogen and for ammonia. It has also been allowed to flow continuously through test solutions, and the amount of impurity in large volumes of the gas has been determined. As the gas has passed through these solutions during each night, and during Sundays as well as on ordinary days, any negligence in purification at these times would have been detected.

"To the daily tests the gas has very rarely yielded any traces of sulphuretted hydrogen. From the large volumes flowing through the test solutions (from 100 to 160 cubic feet) rarely has any of this impurity been separated, and in any case (with one exception) not more than a fraction of a grain.

"The quantity of ammonia in the gas has ranged between 2-10ths and 12-10ths of a grain in 100 cubic feet. Frequently the quantity has been inappreciable.

"The gas has been generally free from naphthaline and from oily and tarry matter.

"The quantity of sulphur existing in the gas, in combination with carbon, as bisulphide of carbon and organic sulphur, has been very variable; it has, however, seldom exceeded 22 grains in 100 cubic feet of gas. The general range has been between 11 grains and 19 grains.

"The committee have nearly completed, at the Rochdale Road station, the construction of a large condenser between the hydraulic main and the washers and scrubbers, which will allow of the application of improved means of reducing the amount of bisulphide of carbon.

"I have the honour to be, sir, yours respectfully,

(Signed) "John Leigh, M.R.C.S."

"*The Gas Committee, Manchester Corporation.*

"*Manchester, Sept.* 15, 1875.

"Gentlemen—We have pleasure in reporting that we have completed the audit of the gas accounts for the year ending June last, and having found the year's accounts correct, have certified the same in the usual manner by affixing our signature to the various abstracts of the accounts in your books.

(Signed) "Saml. E. Cottam and Son."

The expenditure on capital account during the past year has amounted to the sum of £36,626 19s. 2d., the particulars of which are given in the summary of receipts and expenditure, and in the statement of assets and liabilities.

After careful consideration of the financial position of the department, your committee have resolved to recommend the council to reduce the price of gas 2d. per 1000 cubic feet, such reduction to commence from the 25th day of December next.

On behalf of the Gas Committee,

John King, Jun., Mayor, Chairman.

Gas Offices, Albert Square, Sept. 22, 1875.

Dr. — *Profit and Loss Account, for the Year ending June* 24, 1875. — *Cr.*

To Cannel				£164,012	2	3
Retort men's wages				28,179	7	7
Retorts, materials, and setting				5,600	5	3
Purifying charges				4,554	16	1
Labourers wages, and repairs, &c., of works—						
Gaythorn station	£7,828	18	6			
Rochdale Road station	7,657	13	5			
Street-mains	5,591	2	11			
Droylsden works	250	12	5			
Repairs of hired meters	404	1	9			
				21,732	9	0
Salaries				9,976	14	11
Collectors poundage, &c.				4,998	16	9
Chief and other rents, rates, and taxes, &c.—						
Chief rents	£449	12	2			
Rates and rent of offices	725	16	8			
Rates on stations and street-mains	6,513	12	7			
				7,689	1	5
Income-tax				654	8	4
Amount transferred to capital account for depreciation of works—						
Gaythorn station—						
4 p. ct. on buildings (£70,767 17s. 4d.)	£2,830	14	3			
5 p. ct. on apparatus (£46,242 18s. 7d.)	2,312	2	11			
				£5,142	17	2
Rochdale Road station—						
4 p. ct. on buildings (£114,207 19s. 2d.)	£4,568	6	4			
5 p. ct. on apparatus (£65,610 12s. 9d.)	3,280	10	7			
				7,848	16	11
Droylsden works—						
4 p. ct. on buildings (£6520 18s. 0d.)	£260	16	8			
5 p. ct. on apparatus (£6757 12s. 2d.)	337	17	7			
2½ p. ct. on main-pipes (£2627 1s. 0d.)	65	13	6			
10 p. ct. on meters and service-pipes (£764 8s. 10d.)	76	8	10			
				740	16	7
Street-mains store (Poland Street)—						
4 p. ct. on buildings (£1522 18s. 1d.)	£60	18	3			
5 p. ct. on apparatus (£383 11s. 8d.)	19	3	7			
				80	1	10
Street-mains—						
2½ per cent. on main-pipes (£221,479 18s. 3d.)				5,536	19	11
Hired meters and fittings—						
10 per cent. on £35,523 3s. 1d.				3,552	6	4
Meter-proving apparatus—						
10 per cent. on £64 2s. 4d.				6	8	3
				22,908	7	0
Stationery and advertising				418	18	3
Law stationery, receipt, postage, and deed stamps, &c.				309	16	5
Clothing for inspectors, &c.				331	13	0
Subscriptions to Infirmary, Eye Hospital, &c.				85	6	9
Miscellaneous expenses				509	0	6
Bad debts				988	14	7
Balance carried down				106,807	6	5
				£379,757	3	9
Interest on loans, &c. (less income-tax)				£17,182	18	8
Amount transferred to capital account, towards liquidation of mortgage debt				28,514	17	11
Surplus payable to the improvement department				35,257	2	1
Amount retained towards repayment of advances made to the Improvement Committee in anticipation of profits				25,852	7	9
				£106,807	6	5

By Gas-rental—						
Within the city—						
Private consumers	£230,109	18	11			
Meter-rents	4,779	9	4			
Public lamps	12,999	16	2			
				£247,889	4	5
Beyond the city—						
Private consumers	£71,532	2	8			
Meter-rents	1,415	14	6			
Public lamps	5,269	2	1			
				78,216	19	3
				£326,106	3	8
Coke				29,059	10	10
Tar				14,325	13	8
Ammonia water				10,265	15	7
				24,591	9	3
				£379,757	3	9
Balance brought down, being the gross profit on the year's working				£106,807	6	5
				£106,807	6	5

General Summary of Receipts and Expenditure on Capital and Revenue Account, June 24, 1875.

Dr.			*Cr.*		
To Balance in the bank, June 24, 1874	£41,656 6 2		By Loans repaid		£26,390 0 0
Ditto in the treasurer's hands, June 24, 1874	196 5 6		Improvement and Chorlton-upon-Medlock Committees—		
Ditto of sums owing to and by the committee, including stocks on hand, June 24, 1874	76,860 4 7		Surplus for the year ending June 24, 1874	£29,626 9 5	
		£118,712 16 3	Advanced in anticipation of profits	183 9 4	
Balance of profit and loss account, as per statement		61,109 9 10			29,809 18 9
Loans received		865 17 0	Expenditure on capital account, viz.—		
Materials sold (capital account) as per statement—			Gaythorn station	£432 18 7	
Droylsden station		1 3 10	Rochdale Road station	18,738 10 0	
Amount transferred from revenue account—			Droylsden station	949 3 4	
For depreciation of works		22,908 7 0	Bradford Road station	191 11 9	
Liquidation of mortgage debt		28,514 17 11	Street-mains store	24 10 0	
			Street-mains	8,411 4 4	
			Service-pipes (one moiety)	1,428 13 10	
			Hired meters, &c.	6,450 7 4	
					36,626 19 2
			Balance in the bank, June 24, 1875	£61,475 2 6	
			Ditto in the treasurer's hands, June 24, 1875	422 17 3	
					61,897 19 9
			Ditto of sums owing to and by the committee, including stocks on hand, June 24, 1875		77,387 14 2
		£232,112 11 10			£232,112 11 10

Statement of Assets and Liabilities, June 24, 1875.

PERMANENT ASSETS.

Gaythorn station—			
Land, buildings, and apparatus, as per last report—			
Land	£60,467 16 10		
Buildings	70,767 17 4		
Apparatus	46,242 18 7		
	£177,478 12 9		
Less—depreciation	5,142 17 2		
	£172,335 15 7		
One year's outlay to June 24, 1875—			
Yard mains	£266 9 6		
Boundary walls	166 9 1		
	432 18 7		
			172,768 14 2
Rochdale Road station—			
Land, buildings, and apparatus, as per last report—			
Land	£31,805 4 10		
Buildings	114,207 19 2		
Apparatus	65,610 12 9		
	£211,623 16 9		
Less—depreciation	7,848 16 11		
	£203,774 19 10		
One year's outlay to June 24, 1875—			
Yard-mains	£30 12 8		
Exhausters	1,015 16 1		
Experimental testing-house	46 1 9		
Revivifying shed and tar-well	22 7 9		
New cannel-stores	6,563 14 4		
,, cooler	5,355 3 6		
,, hydraulic charging, &c., apparatus	5,600 12 5		
,, station-meter	104 1 6		
	18,738 10 0		
			222,513 9 10
Droylsden station—			
Buildings and apparatus, as per last report—			
Buildings	£6,520 18 0		
Apparatus	10,149 2 0		
	£16,670 0 0		
Less—			
Materials sold	£1 3 10		
Depreciation	740 16 7		
	742 0 5		
	£15,927 19 7		
One year's outlay to June 24, 1875—			
Land (purchase of chief rents)	£828 17 3		
Main-pipes	34 1 8		
Service-pipes and hired meters	86 4 5		
	949 3 4		
			16,877 2 11
Bradford Road station—			
Land, as per last report	£30,251 18 0		
One year's outlay to June 24, 1875	191 11 9		
			30,443 9 9
Street-mains store (Poland Street)—			
Land, buildings, and apparatus, as per last report—			
Land	£1,406 0 0		
Buildings	1,522 18 1		
Apparatus	383 11 8		
	3,312 9 9		
Less—Depreciation	80 1 10		
	£3,232 7 11		
One year's outlay to June 24, 1875	24 10 0		
			3,256 17 11
Street-mains—			
Main-pipes, as per last report	£221,479 18 3		
Less—depreciation	5,536 19 11		
	£215,942 18 4		
One year's outlay to June 24, 1875	8,411 4 4		
			224,354 2 8
Service-pipes—			
Service-pipes laid, as per last report	£21,252 5 3		
Moiety of year's outlay, charged to capital account	1,428 13 10		
			22,680 19 1
Hired meters, &c.—			
Outlay, as per last report	£35,523 3 1		
Less—depreciation	3,552 6 4		
	£31,970 16 9		
One year's outlay to June 24, 1875	6,450 7 4		
			38,421 4 1
Meter-proving apparatus—			
Outlay, as per last report	£64 2 4		
Less—depreciation	6 8 3		
			57 14 1
Total amount of permanent assets			£731,373 14 6

FLOATING ASSETS.

Cannel, retorts, and other materials on hand—		
Revenue account	£54,446 3 6	
Gas-rents, and sundry accounts due to the committee—		
Revenue account	70,824 8 0	
Extension ditto	2,072 3 4	
Amount paid in advance to the improvement department, in anticipation of profits	52,309 18 0	
Balance in the bank	61,475 2 6	
Ditto in the treasurer's hands	422 17 3	
		241,540 12 7
		£972,914 7 1
Excess of assets, June 24, 1875		£427,799 14 7
Ditto of assets, June 24, 1874		399,284 16 8
Increase, being the amount charged upon the profit for the present year towards liquidation of mortgage debt, and carried to capital acct.		£28,514 17 11

LIABILITIES.

Mortgage debt—			
Act of 1844—1st charge	£79,466 0 9		
Ditto—2nd ditto	28,066 10 6		
Ditto of 1854	35,510 0 0		
Ditto of 1858	55,797 10 0		
Ditto of 1867	181,574 3 9		
Consolidated stock	46,630 0 0		
Total amount secured by mortgage		£427,044 5 0	
Sums advanced, not secured by mortgage—			
Indian Relief Fund Committee	£3,500 0 0		
Admiral Duff's Charity	1,250 0 0		
Lamplighters fine-fund	180 0 0		
Eliza Ward	270 0 0		
Robert Hargraves	15 17 0		
William Hamman	50 0 0		
	5,265 17 0		
		£432,310 2 0	
Purchase of land, the purchase-money being left in the hands of the committee, at interest		1,750 0 0	
Sundry accounts owing—			
Revenue account	£31,797 15 11		
Extension ditto	3,207 17 8		
		35,005 13 7	
Deposits in hand		14,939 7 1	
		£484,005 2 8	
Surplus for the year ending June 24, 1875, payable to the improvement department		35,257 2 1	
Retained towards repayment of advances to the improvement department, in anticipation of profits		25,852 7 9	
Balance, being excess of assets		427,799 14 7	
		£972,914 7 1	

[APPENDIX A.]

Statement of the Lamp and Private Rental (including Meter-Rents) derived from the Townships within and beyond the City respectively, for the Years 1873-74 and 1874-75.

	Half Year ending Dec. 25, 1873.			Half Year ending June 24, 1874.			Total for the Year 1873-74	Half Year ending Dec. 25, 1874.			Half Year ending June 24, 1875.			Total for the Year 1874-5.
Within the city—	£ s. d.	£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.		£ s. d.
Township of Manchester—														
Private rental	62153 2 10			69294 17 1				70152 13 7			74275 3 1			
Public lamps	3345 19 10			3031 12 6				3410 17 3			3086 4 9			
		65499 2 8			72326 9 7				73563 10 10			77361 7 10		
Other townships—														
Private rental	39593 4 3			44055 8 5				44170 19 5			46290 12 2			
Public lamps	2704 0 6			3204 0 11				3232 10 4			3270 3 10			
		42297 4 9			47259 9 4				47403 9 9			49560 16 6		
Total within the city		107796 7 5			119585 18 11		227382 6 4		120967 0 7			126922 3 10		247889 4 3
Beyond the city—														
Private rental	30550 10 2			33798 19 11				36813 0 3			36134 16 11			
Public lamps	1910 16 2			2358 0 0				2454 19 4			2814 2 9			
Total beyond the city		32461 6 4			36156 19 11		68618 6 3		39267 19 7			38948 19 8		78216 19 3
Gross rental		140257 13 9			155742 18 10		296000 12 7		160235 0 2			165871 3 6		326106 3 8

Within the city: Gross rental (1873-74) £227,382 6s. 4d.; ditto (1874-75) £247,889 4s. 5d.; increase, £20,506 18s. 1d. Beyond the city: Gross rental (1873-74) £68,618 6s. 3d.; ditto (1874-75) £78,216 19s. 3d.; increase £9598 13s. 0d. Total: Gross rental (1873-74) £296,000 12s. 7d.; ditto (1874-75) £326,106 3s. 8d.; increase, £30,105 11s. 1d.

[APPENDIX B.]

Comparative Statement of the Quantity of Gas transmitted from the Works, in the Day-time and during the Twenty-four Hours, for the Years 1873-74 and 1874-75.

	Day-time.				Twenty-four Hours.			
	1873-74.	1874-75.	Increase.	Decrease.	1873-74.	1874-75.	Increase.	Decrease.
	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.
July	16,888,000	15,737,000	....	6·69	70,787,000	69,640,000	....	1·62
August	18,902,000	16,710,000	....	11·59	88,641,000	87,091,000	....	1·74
September	22,748,000	20,619,000	....	9·35	119,033,000	119,862,000	·69	....
October	29,820,000	30,152,000	1·11	....	174,648,000	182,140,000	4·28	....
November	34,691,000	35,913,000	3·52	....	218,763,000	225,069,000	2·88	....
December	44,768,000	58,869,000	31·49	....	254,215,000	275,430,000	8·34	....
January	40,885,000	43,331,000	5·98	....	238,491,000	241,998,000	1·05	....
February	34,402,000	40,182,000	17·09	....	189,301,000	203,324,000	7·4	....
March	27,868,000	38,960,000	39·79	....	157,938,000	178,665,000	13·13	....
April	19,765,000	29,650,000	50·01	....	108,424,000	123,682,000	15·91	....
May	19,939,000	23,169,000	16·19	....	91,135,000	93,858,000	2·98	....
June	16,988,000	21,125,000	24·35	....	67,081,000	75,632,000	12·74	....
Total	327,664,000	374,737,000	14·36	....	1,778,457,000	1,878,391,000	4·38	....

During the day-time (1873-74) 327,664,000 cubic feet; (1874-75) 374,737,000 cubic feet; increase, 47,073,000 cubic feet. During the twenty-four hours (1873-74) 1,778,457,000 cubic feet; (1874-75) 1,878,391,000 cubic feet; increase, 99,934,000 cubic feet.

[APPENDIX C.]

Table showing the Number of each Size of Meters in use on the 24th of June, 1874 and 1875 respectively.

Size of Meters.	Townships within the City.														Townships beyond the City.		Total.		Increase.	Decrease.
	Manchester.		Chorlton-on-Medlock.		Hulme.		Ardwick.		Beswick.		Cheetham.		Total within the City.							
	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.		
1 light	38	35	17	13	10	10	8	7	..	..	..	..	73	65	24	23	97	88	..	9
2 lights	11428	11050	3641	3649	6663	6614	2500	2564	435	461	1577	1522	26244	23860	9311	9507	35555	33367	..	188
3 ,,	4000	3934	2448	2588	2218	2299	730	761	79	105	1197	1276	10672	10963	3593	4027	14265	14990	725	..
5 ,,	2705	2686	1633	1711	702	762	330	351	34	41	859	924	6263	6475	2752	2993	9015	9468	453	..
10 ,,	1583	1624	488	520	214	233	127	131	9	12	235	275	2656	2795	1049	1189	3705	3004	199	..
20 ,,	924	958	127	145	88	96	45	52	2	2	59	69	1245	1322	356	370	1601	1692	91	..
30 ,,	387	407	40	39	26	31	8	11	2	3	26	29	489	520	122	131	611	651	40	..
45 ,,	33	38	4	4	2	2	2	2	..	..	..	..	41	46	9	9	50	55	5	..
50 ,,	269	279	20	20	12	15	10	11	2	2	14	16	327	343	61	69	388	412	24	..
60 ,,	113	120	7	9	16	16	1	2	..	..	7	8	144	155	13	16	157	171	14	..
80 ,,	96	98	9	9	10	9	4	5	..	..	1	1	120	122	19	19	139	141	2	..
100 ,,	154	151	10	11	10	9	4	4	1	1	6	9	185	185	36	39	221	224	3	..
150 ,,	48	48	5	6	7	7	4	4	..	..	2	2	66	67	15	14	81	81	..	..
200 ,,	21	23	3	4	2	3	2	2	..	..	3	3	31	35	12	14	43	49	6	..
250 ,,	4	3	..	..	..	..	..	..	1	1	..	..	5	4	1	1	6	5	..	1
300 ,,	17	16	4	4	2	2	..	..	..	..	3	3	26	25	14	14	40	39	..	1
500 ,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..
600 ,,	3	3	..	..	..	..	..	..	..	..	..	..	3	3	..	..	3	3	..	..
1000 ,,	..	1	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	2	1	..
Total	21823	21474	8456	8732	9982	10108	3775	3907	565	628	3989	4137	48590	48986	17389	18357	65979	67343	1563	199

Total increase, 1563. Deduct decrease, 199; net increase, 1364 meters.

Statement showing the Number and Size of Meters on Hire on June 24, 1875 (included in the above Table).

	1 Light.	2 Lights.	3 Lights.	5 Lights.	10 Lights.	20 Lights.	30 Lights.	50 Lights.	60 Lights.	80 Lights.	100 Lights.	150 Lights.	Total, 1874.	Total, 1875.	Increase. 1875.
Within the city	63	13344	5102	2323	604	161	46	23	18	6	13	1	20518	21704	1186
Beyond the city	10	3146	1912	1285	216	18	8	3	2	1	5	..	5818	6606	788
Total	73	16490	7014	3608	820	179	54	26	20	7	18	1	26336	28310	1974

[APPENDIX D.]

Main Pipes Laid and Taken Up during the Year ending June 24, 1875.

Laid.	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 11 in.	Diam. 12 in.	Diam. 15 in.	Diam. 16 in.	Diam. 17 in.	Diam. 18 in.	Diam. 24 in.	Total Length.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Townships within the city—																
Manchester	2889	590	139	..	131	130	21	18	..	139	84	..	..	6	17	4164
Chorlton-upon-Medlock	2109	117	383	..	73	..	..	..	..	..	..	..	..	..	..	2682
Hulme	1402	..	..	..	80	..	..	..	..	..	..	..	55	190	..	1727
Cheetham	798	..	..	..	..	..	..	..	..	..	..	..	..	..	..	798
Ardwick	1476	..	73	..	182	..	..	..	..	..	..	..	..	..	..	1731
Beswick	783	..	..	..	..	..	..	..	..	..	..	..	..	..	..	783
	9457	707	595	..	466	130	21	18	..	139	84	..	55	196	17	11885
Townships beyond the city	9657	1970	1451	..	1154	25	..	..	..	..	..	..	..	..	..	14257
Total	19114	2677	2046	..	1620	155	21	18	..	139	84	..	55	196	17	26142
TAKEN UP.																
Townships within the city	443	693	369	147	233	35	..	..	74	..	35	50	..	13	..	2092
Townships beyond the city	62	816	..	..	..	..	..	..	..	..	..	..	..	..	..	878
Total.	505	1509	369	147	233	35	..	..	74	..	35	50	..	13	..	2970
Laid during year 1874-75	19114	2677	2046	..	1620	155	21	18	..	139	84	..	55	196	17	26142
Taken up during year 1874-75	505	1509	369	147	233	35	..	..	74	..	35	50	..	13	..	2970
Total																23172

[APPENDIX D—*continued.*]

Summary.

	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 7 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 11 in.	Diam. 12 in.	Diam. 13 in.	Diam. 14 in.	Diam. 15 in.	Diam. 16 in.	Diam. 17 in.	Diam. 18 in.	Diam. 20 in.	Diam. 22 in.	Diam. 24 in.	Diam. 30 in.	Total Length
Pipes laid to June 24, 1874—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Within the city. . .	240973	123297	50217	15010	31100	738	14790	13475	1438	353	29076	309	7213	4929	4043	..	5628	324	477	6782	2520	552692
Beyond the city. . .	125754	56316	40849	6621	29667	410	24989	13517	1327	1808	20270	..	749	305	..	..	4031	..	..	315	..	336928
Pipes laid during the year ending June 24, 1875—	366727	179613	101066	21631	60767	1148	39779	26992	2765	2161	49346	309	7962	5234	4043	..	9659	324	477	7097	2520	889620
Within the city . . .	9457	707	595	..	466	..	130	21	18	..	139	..	..	84	..	55	196	..	..	17	..	11885
Beyond the city. . .	9657	1970	1451	..	1154	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14257
	385841	182290	103112	21631	62387	1148	39934	27013	2783	2161	49485	309	7962	5318	4043	55	9855	324	477	7114	2520	915762
Deduct pipes taken up	505	1509	369	147	233	..	35	..	..	74	..	..	..	35	50	..	13	..	..	..	..	2970
Total	385336	180781	102743	21484	62154	1148	39899	27013	2783	2087	49485	309	7962	5283	3993	55	9842	324	477	7114	2520	912792*

* Total, 518½ miles and 232 yards.

[APPENDIX E.]

Statement showing the Amount of Gross Profit, and the Mode of its Appropriation; also the Amount of Borrowed Money Owing, and the Excess of Assets, &c., from the Year 1862 to the present Date.

Year ending June 24.	Profits.	Maximum Price of Gas, per 1000 Feet, within the City.	Appropriation of Gross Profits. Interest.	Liquidation of Mortgage Debt.	Surplus.	Amount advanced to Imprvmnt. Committee in anticipation of Profits.	Paid over for Improvement Purposes.	Retained tow'rds Repayment of Advances made to the Improvement Committee in anticipation of Profits.	Balance owing of Amounts advanced in anticipation of Profits.	Borrowed Money Owing.	Amount charged to Revenue in respect of Depreciation of Works and Mains.	Excess of Assets.
	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1862 .	42667 7 1	4 0	15482 3 2	19330 14 4	7854 9 7	....	7854 9 7	....	....	382539 7 10	12179 4 11	126591 4 6
1863 .	55804 12 9	Half year . 4 0 " . 3 9	14932 17 8	18609 17 4	22261 17 9	....	22261 17 9	....	....	362877 8 10	12666 18 11	145201 1 10
1864 .	59545 18 9	Half year . 3 9 " . 3 6	13888 12 10	17810 1 0	27847 4 11	....	27847 4 11	....	....	335808 16 9	12690 12 9	163011 2 10
1865 .	56432 4 5	Half year . 3 6 " . 3 2	13086 10 9	17587 0 11	25758 12 9	....	25758 12 9	....	....	306951 2 2	13050 6 6	180598 3 9
1866 .	52553 2 10	3 2	13252 13 0	19784 2 0	19516 7 10	....	19516 7 10	....	....	347472 2 11	13817 2 9	200382 5 9
1867 .	47323 0 4	3 2	14167 11 7	19898 0 4	13257 8 5	....	13257 8 5	....	....	331725 9 7	14628 8 6	220280 6 1
1868 .	49546 4 7	3 2	14314 17 9	20246 0 5	14985 6 5	13059 8 5	28044 14 10	....	....	351035 10 4	15173 2 5	239685 15 6
1869 .	52736 18 4	3 2	15467 12 6	22688 14 4	14580 11 6	11303 19 8	25884 11 2	....	24363 8 1	335469 8 5	15387 15 7	262374 9 10
1870 .	65343 10 8	3 2	16784 13 8	24487 6 0	24071 11 0	3750 0 0	27821 11 0	....	28113 8 1	432941 1 9	17633 5 10	286861 15 10
1871 .	79322 9 5	3 2	18329 0 5	27050 15 11	33942 13 1	....	28020 11 11	5922 1 2	22191 6 11	448593 9 5	19602 10 5	313912 11 9
1872 .	63257 9 7	3 2	18539 19 6	27805 15 11	16911 14 2	13293 10 3	30205 4 5	....	35484 17 2	459593 9 5	22283 6 8	341718 7 8
1873 .	63603 0 6	One Qr. . 3 2 Three " . 3 4	18413 7 1	28588 19 6	16600 13 11	16641 11 6	33242 5 5	....	52126 8 8	460640 11 0	22614 18 6	370307 7 2
1874 .	77465 12 2	Half Year . 3 4 " . 3 8	18861 13 3	28977 9 6	29626 9 5	183 9 4	29809 18 9	....	52309 18 0	457834 5 0	22849 4 5	399284 16 8
1875 .	106807 6 5	3 8	17182 18 8	28514 17 11	61109 9 10	....	35257 2 1	25852 7 9	26457 10 3	432310 2 0	22908 7 0	427799 14 7
Total.	772408 17 10	....	222704 11 10	321379 15 5	328324 10 7	....	354782 0 10	....	....	....	237485 5 2	....

CITY OF MELBOURNE (AUSTRALIA) GAS AND COKE COMPANY.

PROPOSED PURCHASE OF THE WORKS BY THE MELBOURNE CITY COUNCIL.

By the 61st section of the Melbourne Gas and Coke Company's Act (16 Vict., 1853) it is provided that if at any time after Jan. 1, 1876, the Mayor, Aldermen, Councillors, and citizens of the city of Melbourne shall think fit, it shall be lawful for them to purchase the entire property of this company.

In the month of February last, the secretary of the company (Mr. John Scott) addressed a letter to the town-clerk, calling attention to the above-named section, and stating that "in view of this fact, and considering that many large contracts with the Government, municipal, and other bodies will terminate some months before and on the date mentioned, for which arrangements will have to be made some months antecedently, together with the concurrent necessity of taking preliminary steps to acquire statutory powers largely in advance of, and materially different from, those at present possessed, in order that the public requirements may be adequately met"—the directors considered that "those ends would be rendered either unnecessary or be much facilitated, and the public interest promoted, by the council now determining whether or not they will entertain the question of purchase." To assist the council in coming to a decision on the point, the directors offered to give any information or assistance in their power, or that might be required of them.

The above communication having been laid before the council, it was referred to the Public Works Committee for consideration and report. This committee, regarding the question as one of great importance, and feeling that its proper and careful consideration would interfere with their special and general duties, appointed a sub-committee of five members to deal with the subject.

Councillor A. K. SMITH was appointed chairman of the sub-committee, and at their first meeting laid before them the following statement:—

That the city of Melbourne Gas and Coke Company was incorporated by an Act, 16 Vict., dated Jan. 14, 1853, with a capital of £20,000, but with power, under the 51st section, to increase the capital to £40,000.

On Dec. 14, 1854, another Act was obtained, increasing the capital to £100,000, and again, on May 22, 1855, to raise an additional £50,000 on debentures; and subsequently, on Aug. 27, 1857 (21 Vict., No. 14), to still further increase the capital, by the issue of 30,000 shares of £5 each, making their total capital £250,000, with a borrowing power of £50,000—in all, £300,000.

In their first Act of 1853 (16 Vict.), the 61st section gives power to the Corporation of Melbourne to purchase the company's works, and it is to this section that the letter from the secretary of that company refers, and the reply to which we are now met to consider.

At the commencement of the company's operations, it was intended to erect the gas-works upon a site of one acre, in Collins Street West, now occupied by Cuningham and Co.'s wool stores, and only to light that portion of the city bounded by Flinders Street on the south, Bourke Street on the north, Queen Street on the west, and Swanston Street on the east; but the company saw the necessity of extending their operations to the whole of the city proper, and to the then existing suburbs, hence the necessity of seeking and obtaining such sudden and great additions to their capital, as stated above.

Had the company pursued the less liberal policy of supplying the districts only that would pay best, it would in all probability have been able to pay much larger dividends for a time, or until the suburbs either erected gas-works for themselves, or compelled the gas company to guard its interests by extending a supply to such suburbs. However, it is to the gas company's credit that, notwithstanding the then very limited consumption, it determined to carry out extensions ranging from and including St. Kilda to Coburg, and from Sandridge to Hawthorn, under the belief that, as the population settled down in more permanent residences, the consumption of gas would be so greatly increased as to enable them not only to pay a fair dividend on the capital invested, but also, from time to time, to make such reductions in the price of gas as would be a boon to the consumers, as well as lead to an enormous increase in their consumption. To accomplish these desirable objects the company carried out the extensions with energy, under the reasonable hope that, if not interfered with by competing companies, they would be able to pay a fair dividend on the capital invested, as well as reduce the price of gas to the lowest sum consistent with paying such dividend.

How far the company's anticipations have been verified the sequel will show; and here it is only fair to state that, considering the distance from the markets in which they had to procure their plant, and the heavy freights they had to pay in 1854-5, great credit is due to the directors of the gas company for the spirited manner in which they carried out the large and numerous extensions alluded to.

The City Company, however, was not left to work out that problem unopposed, or in all probability it would have now been paying a better dividend upon a reduced price of 6s. 8d. per 1000 feet.

Any one acquainted with the surroundings of the subject who will take the trouble to go into the necessary calculations, will arrive at this conclusion, that if there had been no opposition, the City Company could have sold gas at the present date, at 6s. 8d. per 1000 feet, and paid the same, if not a better dividend, than the shareholders are now receiving. The reason of this is obvious, for with little extra plant they could have supplied all the gas consumed in the city and suburbs where their mains are laid, thereby increasing their consumption over 60 per cent., while the additional cost of laying mains where theirs do not at present exist, and the amount of additional labour and materials for the increased quantity of gas required, would not have amounted to one-third of the sum that has been expended by other companies in existing works, laying duplicate mains, and fixing duplicate services, meters, &c.

At present the total annual consumption of gas in the city and suburbs exceeds 320 million, and yields a revenue of £133,800, exclusive of £27,262 for residual products, making together £161,062. Of this quantity the City of Melbourne Gas and Coke Company supply about 190 million feet, and the balance is supplied by the Collingwood and Fitzroy District Company and the South Melbourne Gas Company, the city works alone being capable of supplying the whole quantity, and having mains large enough to distribute considerably more; proving, beyond a doubt, that their capability to supply greatly exceeds the demand made upon them.

Any one conversant with imperial legislation bearing on the supply of gas to cities and towns in the old country cannot but have observed the great and growing tendency to place the supply of water and gas under the control of local boards, municipal corporations, &c. Where such powers have not been sought, the Provisional Order of 1871, prepared by the Board of Trade and made law by the Legislature, has acted as a wholesome check upon the ruinous competition caused by a plurality of gas companies supplying or seeking to supply the same district, and many instances could be named where the districting arrangements have received the sanction of Government. An alphabetical list of 102 cities and towns in Great Britain and Ireland, where the gas-works belong to local boards, municipal corporations, or commissioners, was given in the JOURNAL OF GAS LIGHTING, Feb. 3, 1874.

Having read the list, the CHAIRMAN proceeded—

The above returns are not complete, but from them it will be found that the average parliamentary maximum price of 26 establishments is 5s. 1½d per 1000 cubic feet. That the actual average selling price of 41 establishments was (in February, 1874) 5s. per 1000 feet. That the average advance in price during 1873, of 48 establishments was 9½d. per 1000 feet, and that the average illuminating power of 48 establishments was 19·64 candles.

The above average quality of the gas is considerably increased by including that from Scotch works, where the quality varies from 26 to 30 candles, the cheapest in the list being Aberdeen with 30-candle gas, at 5s., and the dearest that of Coleraine, with 15-candle gas, at 7s. 6d.

It will also be seen that the price was increased in 1873 from 2d. to 2s. 1d. per 1000 feet, on account of the advance in the price of coal, &c.

The quality of English gas from common coal is comparatively low, no Act compelling the quality to exceed 14 candles; however, as a matter fact, the average quality of the nine London companies is equal to 15·23 candles.

The reason for laying these statistics before you is to show that whilst there is no proper parliamentary standard or minimum quality stated in the Melbourne Gas Company's Act, nor yet any maximum price named, except to limit their dividends to 25 per cent., that they have supplied gas of a better quality than that used in London, exceeding the parliamentary standard there by nearly 25 per cent. The same may be said of the Collingwood Gas Company; and it is creditable to both that at the time when coals advanced over 50 per cent. in price, they neither made nor sought to make any alteration of the price or the quality of the gas, whereas in many instances in England the price of gas was increased from about 3 per cent. to 41 per cent.

The Collingwood Gas Company was started in the interests of the gas consumers, for the purpose of breaking up what was termed the "monopoly" held by the City Company. Its projection was pooh-poohed by the older company, who felt over secure in their well-established position, and, notwithstanding repeated caution, were only awakened to the new company's actual existence when it was too late for successful opposition. A timely and politic concession, on their part, to a reduction in price might have averted those consequences that have been so greatly prejudicial, both to the interests of the gas consumers and the shareholders; and had it been more specially pointed out to the legislative committee to whom the Collingwood Gas Company's bill was referred, that the City Company had not taken advantage of its position by declaring heavy dividends, that they were supplying an article of good quality at a moderate price, and, above all, that the introduction of another company's mains into the localities when they had ample means of supplying all the gas required, instead of being a benefit to the gas consumers, would not only postpone the period of their ability to further reduce the price of gas, but would lead to an unnecessary investment of capital, the interest of which would become an additional tax upon the gas consumers.

The Collingwood Company's bill was, however, passed, containing provisions that the minimum quality of their gas should be 12 candles, and the maximum price 17s. 6d. per 1000 feet. The company commenced supplying gas in May, 1861. The secession of a large number of consumers from the old company had the anticipated result of reducing the dividends of the City Company, and prevented the directors from making those further reductions in the price of gas which, but for the mistaken policy of the Legislature, they would have been able to effect.

The opinion that it was a grave mistake on the part of the Legislature to encourage competition is so fully borne out and endorsed by Mr. E. S. Cathels, the engineer and manager of the Montreal Gas-Works, in his report to the directors of that company, that an extract is now submitted:—

Disadvantage of Opposition Gas Companies.

It has become yearly more and more apparent to the English Legislature, as well as the consumers themselves, that competition in the supply of gas is a mistake, because while it involves a needless waste of capital and a corresponding loss of profit to the companies, it occasions both loss and serious inconvenience to the public by preventing any permanent reductions in the price of gas, and by the frequent and unnecessary breaking up of the streets and pavements arising from the mains and pipes of two or more companies occupying the same.

This frequent disturbance of the streets is of course due not only to the taking up and relaying, from time to time, the mains and pipes of the different companies, but to the necessity, in case of escapes, of ripping up the pavements covering all the sets of pipes, for the purpose of ascertaining from which of these the escape takes place. There is also the serious inconvenience to traffic and business, and disturbance of drains and water-pipes.

Referring to Liverpool, it may be stated that in the year 1847, there being then two gas companies supplying the town, a third company applied to Parliament for an Act to enable it to establish a competition with them, when, after full inquiry, the committee of the Commons to whom the bill was referred came to the wise determination to reject it, on the understanding that the existing gas companies should unite, which they did, and the town has since been supplied by the united companies. Indeed, so well established has become the conviction that one gas company in a town, for numerous reasons, is preferable to more than one, that the committee of the House of Commons, presided over by the Right Hon. Edward Cardwell, the late Minister of War, which sat a few years ago to inquire into the operations and the results of the Metropolitan Gas Act, 1860, proposed to adopt the exclusion of competition as a principle of legislation on the subject; and, after a long and exhaustive inquiry, recommended the amalgamation of the several gas companies supplying London. This recommendation has already been acted upon to a considerable extent; five of the companies have combined, and constructed gigantic works on the river side, some miles below London. Negotiations are also taking place among the remaining companies, and instead of thirteen, as there were formerly, London will probably soon be supplied by one amalgamated company on the south side of the river, and two on the north side.

These remarks require no comment, nor is it necessary to further occupy your attention by showing at any great length that the most experienced Legislature in the world in connexion with gas affairs is opposed to, and looks with great disfavour upon, competing gas companies. A proof of this will be found in the addenda, in which you will find, in a copy of the letters previously read to you, how a committee of the House of Lords dealt with the City of Durham Gas Consumers Bill, and from a perusal of which you will the more readily understand how carefully the committee of the House of Lords guards against the mistake of granting bills to competing companies. In the addenda you will also find special reference to the South Melbourne Gas Company's Bill.

The City Company petitioned against it, but instead of following up and refuting the statements then made, the City Company, apparently despairing of having their objections properly considered, or their rebutting evidence taken, were satisfied with getting a clause inserted as to price, and an amendment upon the 3rd clause, wherein the South Melbourne Gas Company agreed to completely reticulate one place before they went to another.

The City Company made a mistake in allowing false impressions to exist in the minds of the members of the Legislature or the public as to their inability to supply Emerald Hill and Sandridge. They could and should have shown that the sectional areas of their gas-mains for supplying the above municipalities were far in excess of their requirements.

The South Melbourne Company are now laying their mains in the city under an agreement to supply gas to the consumers at 7s. 6d. per 1000 feet, being a reduction of 1s. 6d. below the present price. This company state, in their last half-yearly report, that the directors "have obtained the signatures to a legal bond of nearly all the principal consumers upon the proposed lines of reticulation to consume the gas supplied by the South Melbourne Company, and no other, for a period of two years. The amount of such consumption, as stated by the consumers who have signed the agreement in question, is slightly over £31,000 per annum." It is also stated, "By this means the very cream of the consumption north of the Yarra is secured." If this be so, at the present price of gas, they will abstract 69 million from the supply of the City and Collingwood Companies. But, independent of this decrease in their consumption, the Collingwood Company are already pledged, through their chairman, to reduce the price of gas 1s. per 1000 feet below the price charged by any competing company that may enter the city, and the result will be that the City Company, in self-defence, will have to reduce the price to 6s. 6d. also.

If these prices could be maintained and pay even a moderate dividend to the shareholders, then it might be a matter for congratulation, but, at the present and prospective price of coals and labour, this is too much to hope for with any reasonable chance of its being realized; for if the above price of 6s. 6d. be applied to the balance-sheets of the respective companies for 1874, and the reduction computed upon the quantity of gas disposed of by each, it will at once be perceived that there would be no profits whatever, and that the absorption of their entire reserve-funds, and a further call on their respective shareholders for additional capital, are neither unlikely nor remote contingencies. These reductions would reduce the revenue of 1874 no less than £36,426; but, as the profits during that period only amounted to £28,941, it will be seen that the three companies collectively, instead of being able to pay dividends, would actually make a loss of £7483 for the year. I am, however, aware that reductions in price generally lead to increased consumption, but increased consumption can only benefit a company when the selling is greater than the cost price.

Taking the amount of capital invested in the three companies at £450,000, the shareholders have a right to expect as good a dividend as the Imperial Legislature allows to similar undertakings in the old country—viz., 10 per cent., or £45,000 per annum upon the above-named capital. This £45,000 per annum the shareholders stand to lose, and such has ever been the fate of gas companies who have indulged in the suicidal policy of undue competition, especially in the same districts, and vast sums of money have been lost to shareholders by the directors of a company endeavouring to force or divide a trade amongst two or three companies in a field where there is only sufficient business to be moderately remunerative for one. True, the consumers who are not shareholders get the benefit for a time, but it is only for a time, for one or other of the companies generally succumb and retire from the field, or amalgamate their interests, or when that is provided against, agree to raise the price to such a figure that the consumers have eventually to pay a higher price too often for an inferior article, in order to recoup past losses, and pay dividends upon the cost of works, mains, and management, &c., of three companies instead of one. It is necessary to guard, as far as possible, against such a contingency as an abnormal increase in the price of gas, whereby the lighting of the city might be largely and prejudicially affected. The Collingwood and South Melbourne Companies are not at present in a position to tender for the whole of the public lamps within the city, and this forms another reason why the corporation should have the supply of gas in their own hands.

The supply of the public lamps with gas, therefore, claims attention, and in order that the several members of the council may more fully understand this important part of the city expenditure, I have prepared the following notes for their information, more especially as the personality of the council has been (with the exception of Alderman Smith) entirely changed since the streets of Melbourne were first lighted with gas.

The public lamps, to the number of 274, were first lighted with gas on Aug. 10, 1857.

At that period the price of gas to the general public was 22s. 6d. per 1000 feet, and the contract price per lamp was £17 per annum.

In the second contract the price was reduced from £17 to £14 per lamp per annum. This contract terminated on Sept. 10, 1865, when the number of lamps lighted had increased to 670, and the price of gas had been reduced to 14s. per 1000 feet.

Some months previous to the commencement of the third (and present) contract, tenders were solicited for supplying the public lamps, including lighting, extinguishing, painting lamp-posts and lamps, keeping lamp-glasses clean, &c., &c., when the Collingwood Company tendered at £8 12s. 6d., and the City Company at £7 per lamp per annum (or just one-half the previous rate).

According to calculations based on the terms and conditions of the contract, the price of gas to private consumers, and the dividends paid by both companies, the tender of the Collingwood Company was moderate, and, in fact, less than the corporation could reasonably expect. However, the low price quoted by the City Company obtained the contract, and subsequently enabled the corporation to light double the number of lamps, without increasing the lighting-rate. This was undoubtedly a great boon to the citizens, and the result has been to make Melbourne what it now is—one of the best lighted cities in the world.

Whilst admitting this, it is advisable to inquire into the manner in which so important a contract has been carried out, with the object of determining how far the street-lamps have supplied a uniform light, and as to whether any saving could be effected in the mode of lighting, either to the gas company or the corporation, especially as any saving to the former ought to result in a saving to the latter, as it requires no argument to show that any reduction in the cost of lighting, or in the waste caused by excessive consumption of lamps situated at high altitudes, would enable a gas company to tender at a lower price.

The present ten years contract is nearly expired, and at this time, when the corporation is upon the eve of calling for new tenders, a little information upon the subject may be of use, apart from the corporation purchasing the gas-works, or otherwise.

In stating the results of these inquiries, it may be premised that a gas company are under no obligation to supply gas to the public lamps at a less price than that charged to private consumers, and the only principle that should be recognized is that which usually prevails in ordinary business transactions—viz., that all classes of customers pay an equal price, some allowance being made, as in wholesale dealings, to large customers or to public authorities. A large consumer is ordinarily supplied by one service-pipe and one meter; but it must be borne in mind that every street-lamp may be reckoned as a "consumer," having a service-pipe specially laid for its supply, and would, under that aspect, be subject to the highest charge made by a gas company, the "service-pipe" being liable to the same loss by condensation, leakage, &c., as any ordinary supply-pipe; but inasmuch as there are no meters used for the city lamps, and that the city pays promptly for a large number which, in the aggregate, consume a considerable quantity of gas, it is in accordance with usual business precedents to make allowance for the absence of loss by bad debts, the reduced cost of collection, and the general absence of meters.

To determine what these three items amount to, I have compiled a statement from the published balance-sheets of the City of Melbourne Gas and Coke Company, from the commencement of its operations on Jan. 1, 1856, to Jan. 1, 1875, which shows that the revenue during that period amounted to £1,281,257, and that the bad debts during the same period amounted to £16,334, or nearly 1·28 per cent., whilst the cost of collection closely approximated to 1·33 per cent., and also from careful calculation, the cost of meters, if they had been generally applied to the street-lamps, that together with the expense attending the same, would have amounted to 3s. 1d. per lamp per annum, or a little over 2d. for every 1000 feet of gas consumed by them.

In order to apply these per centages to the existing contract, it is necessary first to determine the average price at which gas has been sold to ordinary consumers during the currency of the contract—viz, from Sept. 10, 1865, to date (May, 1875).

At the commencement of the contract in 1865, the selling price to the general public was 12s. per 1000 feet, and it continued at that price (12s.) for 10⅔ months, after which it was—

Reduced to	7s.	6d.	for	1 month
Then raised to	11	0	„	64 months
Then reduced to	10	0	„	19 „
Then to	9	0	„	22 „

These prices and periods, when worked out, give an average price of 10s. 6¼d. per 1000 feet; and it is to this price that the above reductions apply, and which, collectively, amount to 5¼d. per 1000 feet, thus showing that if the gas com-

pany received 10s. 1d. from the corporation, it would be equivalent to 10s. 6½d. from the general public.

In order to ascertain the actual price per 1000 feet the gas company receive from the corporation under the existing contract at £7 per lamp per annum, the cost of lighting, extinguishing, cleaning glass, painting lamp-posts, general repairs, fines, &c., amounting, collectively, to an average of £1 12s. 6d. per annum, has to be deducted from the above sum, which leaves £5 7s. 6d. to cover cost of gas.

The lamps are each lighted 326 nights during the year, and consume, at the contract rate, 17,604 feet each between the periods of sunset and sunrise; but, as all the lamps have to be lighted at sunset, and none extinguished before sunrise, the lamps on an average are, or should be, lighted 20 minutes before sunset, and are not extinguished until an average of 20 minutes after sunrise, thereby increasing the consumption at the same rate per hour to 18,682 feet, and this is the minimum quantity supplied for the sum of £5 7s. 6d., or a little under 5s. 11½d. per 1000 feet. It will thus be seen that, whilst the price paid by ordinary consumers to both companies throughout the city has averaged 10s. 6½d. per 1000 feet, the Corporation of Melbourne has only paid 5s. 11½., or over 43 per cent. less than the general consumer.

The question here arises, what has been the quantity of gas consumed in the public lamps? In reply, when engineer and manager of the City Gas-Works, in 1856, when the streets were first about to be lighted, I suggested the average meter system as a means of check by the corporation, and a guide for the gas company; and a reference to the records of the check-meter indices during the existing contract will show the negligence of both the corporate officials and those of the gas company, in permitting and continuing a short supply in certain parts of the city, and allowing wanton waste in other parts. This is, however, too grave an assertion to be passed lightly over, or to be dismissed without giving proof of its being correct.

It has been said that the City Gas Company have had a monopoly of the city lamps, and that they have enjoyed the benefit such monopolies generally confer; but if the consumption of the city lamps, as per the registrations of the check-meters, be inquired into, the fallacy of such a statement at once becomes apparent, and it will be found, by a careful examination and correction of the index readings of these meters, that they varied from each other in 1865 from 15,460 feet to 28,580 feet, or about 84 per cent.; in 1866, from 17,000 to 26,620, or over 56 per cent.; in 1867, from 16,700 to 24,100, or over 44 per cent.

These great variations in the quantities of gas consumed may be partially accounted for by the difference of the levels at which they are set, and, consequently, by the difference of pressure under which the gas is consumed; but it must be borne in mind that the very object of having test-meters at all was for the purpose of adjusting the size of the burners, so as to maintain, as far as practicable, a uniform consumption of 4½ feet per hour at the various levels throughout the city; and it seems that this information has been obtained simply to be set aside, for it is found year after year not only that those vast differences exist between the lamps, but that the lamps individually vary abnormally in their annual consumption, as the following tabulated statement will show:—

Site of Lamp with Check Meter.	Consumption in Feet in 1865.	Consumption in Feet in 1866.	Consumption in Feet in 1867.	Total Consumption in Feet.	Remarks.
Swanston Street .	15,460	17,000	21,600	54,060	Jan. 10 to Jan. 10.
Spring Street .	28,580	26,620	24,100	79,300	,, ,,
William Street .	21,670	23,100	22,625	67,395	,, ,,
Flinders Street .	17,700	17,375	16,700	51,775	Feb. 10 to Feb. 10.
				252,530	

The above aggregate consumption of 252,530 feet by four lamps, in three years, shows an average annual consumption of 21,044 feet per lamp, for which the gas company are paid, as before stated, £5 7s. 6d., or at the rate of 5s. 1d. per 1000 feet, or less than one-half the price paid by private consumers.

The difference between the minimum and the maximum consumption of the same lamps during the three years is as follows:—

At Swanston Street.	6140 feet,	equal to	39½ per cent.
,, Spring Street	4480 ,,	,,	18½ ,,
,, William Street	1430 ,,	,,	6½ ,,
,, Flinders Street	1000 ,,	,,	6 ,,

These differences cannot be accounted for either by the increase or decrease of pressure, as it will be seen in the previous statement that, whilst the lamp at Swanston Street increased its consumption at the rate of over 3000 feet per annum, the one at Spring Street (at a much higher level) decreased at the rate of over 2000 feet per annum.

The records of the registration of the check-meters for 1868-69, and to May, 1870, are incomplete, but from May 10, 1870, to May 10, 1875, the indices of the check-meters have been taken and recorded, but for what purpose does not seem evident, certainly not for the benefit of either the corporation or the gas company. Practically, the important information recorded has been altogether ignored and set aside, without any effort being made to equalize the consumption, or to carry out the special agreement between the corporation and the gas company.

During the last five years other three lamps were fitted with meters, and the results of the registration of the seven show that the average consumption in 1870 was at the rate of 21,386 feet per lamp; in 1871, 19,500 feet; in 1872, 17,158 feet; in 1873, 20,808 feet; in 1874, 19,833 feet; and in 1875, at the rate of 19,690 feet per annum.

It will thus be seen that the gas company has been liberal to prodigality in the total quantity of gas supplied, but has failed to remedy short supplies, or yet to check the wanton waste. Independent of the meter registrations, I have tested burners from the street-lamps that have been consuming at the rate of from 6·35 to 9·60 cubic feet per hour.

The following table, compiled for your information, shows the number of lamps lighted per annum at the expense of the ratepayers, since the commencement of the present contract to date, with the amount of fines levied, and the total amount paid to the gas company, exclusive of lamps on and in piers, wharves, toll-roads, public gardens, &c., &c.

Date.	Average Lamps per Month.	Fines Levied.	Total Amount Paid.	Remarks.
1865-66	820 1/12	£2 7 6	£5,691 10 7	
1866-67	1050 10/12	45 15 0	7,233 18 0	
1867-68	1209 10/12	2 16 8	8,460 7 1	
1868-69	1289 7/12	0 10 0	9,175 19 8	The fines amount to ·384 per cent.
1869-70	1373 1/12	48 2 6	9,559 16 1	
1870-71	1499 2/12	33 15 0	10,449 0 1	
1871-72	1561 5/12	46 2 6	10,884 0 6	
1872-73	1619 6/12	86 5 0	11,245 19 3	
1873-74	1695 3/12	46 17 6	11,793 17 6	
1874-75	1752	40 2 6	7,115 12 6	To May 10, 1875.
		£352 14 2	£91,610 1 3	

Out of the above 1752 lamps there are only seven at present fitted with check-meters; and it is well known by experts that more gas will pass through a given burner in a given time without a meter than with one. Taking this into consideration, together with the various abnormal registrations of the check-meters, there is no doubt whatever but that the gas company supplies in the aggregate a vast quantity of gas more than is required to fulfil the conditions of its contract with the corporation. This contract is one of no ordinary importance, and its magnitude will be better understood when it is known that the last year's expenditure for gas by the City Council amounted to no less than £13,400 11s. 9d., including wharves, toll-roads, town-hall, markets, &c., whilst for the present year of 1875 the lighting rate amounts to £13,555 2s. 10d., in addition to which a further sum of about £1300 will be required for lighting toll-roads and corporation buildings, &c., making a total of £14,855; or an amount in excess of the total dividend paid by the City Company to its shareholders.

The contract for lighting the street-lamps expires with the present year, and as the council has instructed the Public Works Committee to prepare specifications, and to call for tenders for their subsequent lighting, a good opportunity now occurs of introducing pressure regulators, and an improved and speedier mode of lighting, so as to ensure, as far as practicable, a uniform rate of light, without the "extremes" of short supply, and the great waste previously alluded to.

It is principally for this purpose that I have referred to the subject at such length, and previous to resuming the more immediate object we have met to consider. I respectfully submit that the council should first have determined whether it would purchase the gas-works or not, previous to calling for tenders for lighting the city lamps; but, as the council has determined otherwise, the duty of the Public Works Committee has been to prepare specifications that will strictly define what the gas company have to supply, and what the corporation have a right to demand. These specifications, so far as the Public Works Committee are concerned, only excise three nights during each synodical revolution of the moon—viz., the night before, the night of, and the night after the full moon, during which time the lamps are to remain unlit; and even this, as you are aware, met with some opposition, and it was only when it was stated that to light the lamps these three nights each full moon would entail an additional and unnecessary expenditure of £1300 per annum, that their exception was recommended to the council. A further saving might, however, be effected (especially if the supply and lighting were in the hands of the corporation), and that is, by taking further advantage of the moonlight, both before and after the night of full moon, extinguishing the street-lamps when the moon's light was greater than that given by the street-lamps; and this alteration would effect a further saving of over £1000 per annum, even if the lamps had to be lighted when clouds partially obscured the moon's light.

Having thus referred at considerable length to the street-lamps, I will now resume the subject at the point where we left off—namely, the great loss sustained sooner or later by the community, owing to undue competition in the supply of gas. The case of a gas company is exceptional, so far as usual manufacturing or trade competition is concerned. A gas company not only manufacture gas, but deliver the same to the burners in our dwellings, and the cost of plant for delivery enormously exceeds the cost of plant for manufacture.

As an illustration, imagine a second and a third company seeking each to establish a railway from Melbourne to Geelong, running close alongside each other. The Legislature would assuredly refuse to grant a bill for their construction; the press would point out that a second and third line were not required; and the Commissioner of Railways would inform his colleagues that the existing line was able to convey all the passengers and merchandise to and from Geelong, and could do so if the traffic was quadrupled; and would also reasonably ask what argument could justify the intended waste of the shareholders means in constructing, at enormous expense, other two lines of railway to divide a traffic that could barely support one line? Such a proposition would be so palpably absurd, and so easily understood, that no sane man would attempt to advocate such a measure.

The policy of three or more gas companies competing against each other in the same district is equally as absurd, though less understood. This competition actually exists. The Legislature have passed their several bills, and the companies have laid, and are now laying, duplicate and triplicate mains alongside each other, and for these costly and unnecessary mains the gas-consuming public will ultimately have to pay, and it is now for us to consider how this unsatisfactory state of things can be remedied.

Fortunately, all the streets of the city and suburbs have not yet been reticulated with gas-mains, and, therefore, an outlet exists to which those mains that have been unnecessarily laid can be removed for more legitimate and profitable use.

The harm has not been all accomplished, and at this stage of its existence it is desirable to use every effort to arrest its further progress, with the object of making all subsequent reductions in the price of gas more permanent in their character, as well as to guard against the future unnecessary expenditure of money in unproductive works. Having stated that gas supply is exceptional in its character, and that the benefits arising from ordinary competition do not apply to it, I will proceed to show reasons for this well-grounded opinion by referring to loss by leakage, &c.

The loss of gas by leakage, condensation, &c., is so enormous, that it requires special notice in order to give a correct idea of its extent.

The total length of mains and services belonging to the three exising companies is over 490 miles, and the leakage, &c., therefrom, and the condensation, &c., therein, amounts annually to over 96 millions, or nearly 23 per cent. upon the total quantity of gas manufactured. Taking, then, into consideration the relative lengths and sizes of the duplicate and triplicate mains, &c., it will be found that, if the gas supply of Melbourne and its suburbs had been transmitted through one set of mains instead of three, no less than 40 per cent. of the above waste would be saved. To afford some standard of comparison whereby to estimate the extent of this large and utterly wasted quantity of gas, I may state, for your information, that it is greater than the entire quantity consumed in the following townships and districts—viz., Warrnambool, Stawell, Back Creek, Clunes, Daylesford, Williamstown, Kyneton, Castlemaine, South Yarra, Toorak, Prahran, and Windsor; and the mere cost of production for coals, lime, and general charges (exclusive of wear and tear and value of residual products), amounts to £10,237, or over 5 per cent. upon £200,000. This is no trifling sum to be lost or saved, and proves that competition of this kind is of an exceptional character. It is a fact that such competition exists, and that at present the South Melbourne Gas Company are expending about £30,000 to enlarge their works, and lay down a (third) set of mains to supply consumers north of the Yarra. The practical effect of this measure will be to diminish the quantity of gas supplied by the City and Collingwood Companies, and thereby still further increase their large per centage of loss by leakage, &c., and that at a time when they must of necessity make a great reduction in price in order to compete with each other; and possibly, as in the case of Emerald Hill and Sandridge, actually supply gas to the general public at a loss to the shareholders. The consumers who are not shareholders in the older companies receive the benefits of those reductions, whether forced or voluntary; and I may here repeat, in order not to be misunderstood, that if these promised reductions were to remain permanent, and allowed the shareholders to receive a moderate dividend, there would be reason for congratulation; but long experience and careful observation warrant the opinion that undue competition in the supply of gas here will lead to the same results as elsewhere—viz., a great loss to the shareholders in the meantime, and, subsequently, in the consumers having to pay an unnecessary high price for their gas; and our regrets at these prospects are not lessened by the fact

that many of the shares in these companies are held in trust for the widow and the fatherless.

The supply of Paris with gas presents a notable instance of the benefits that arise from one company supplying all the gas consumed in that city and its suburbs, where competition is prohibited by statute. The selling price there is under 6f., or 5s., per 1000 feet, although the gas coals are imported from Britain. The company pay the municipality a tax upon the quantity of gas manufactured, which amounted last year to no less than £111,147, irrespective of taxes. It also paid the state taxes to the amount of £18,034, and, after paying 5 per cent. interest on debenture bonds, amounting to 59,919,659f., the company divided the balance of profits as follows:—To the shareholders, £735,152 sterling; to the corporation, £240,000. It will thus be seen that the Corporation of Paris received no less than £351,147 sterling from the gas company.

The following principal items will enable you to compare the amount of capital invested, the revenues, expenditure, profits, dividends, &c., in the gas supply of Paris and Melbourne:—

	Paris and Suburbs. One Company.	Melbourne & Subs. Three Companies.	Proportion.
Capital invested	£5,867,802	£448,776	13 to 1
Consumption	6536½ millions.	320 millions.	20 to 1
Annual revenue	£2,360,480 sterling.	£161,137	14 to 1
Annual expenditure	£1,377,997	£132,196	10 to 1
Profits	£982,483	£28,941	34 to 1
Dividends	22 per cent.	8 per cent.	

It will thus be seen that Paris, with 13 times the capital, 20 times the consumption, 14 times the revenue, and 10 times the expenditure, has nearly 34 times the amount of profit divided by the three Melbourne Companies, irrespective of the taxes paid by the former to the corporation and state.

These magnificent results are chiefly attributable to the absence of competition, and the gas consumers in the French capital are anticipating (what the shareholders can well afford to give, viz.) a very considerable reduction in price upon the termination of the present "concession."

By the foregoing I have endeavoured to show how manifestly it is the duty of the corporation, in the interest of the citizens, to take the initiative steps, and at once decide to take over the works of the City Company, while at the same time provision should be made for the speedy absorption of all three companies.

The special advantages that would be derived from the gas supply being in the possession and under the control of a Metropolitan Board of Works, or of the City and Suburban Municipal Councils, may be classed as follows:—

That all expenditure in the procuration, laying and fixing of street-mains, service-pipes, and meters, &c., in duplicate and triplicate, would in future be avoided.

That the benefits arising from this very desirable alteration would effect an immense saving in the quantity of gas at present lost by inordinate leakage and condensation.

That such an arrangement would allow the utilization of the existing duplicate mains, service-pipes, and meters, for the supply of new districts, thereby gradually and largely increasing the revenue at the cost of mere removal, laying, and fixing.

That money can be borrowed wherewith to purchase the existing works, the interest of which might be paid by 5 per cent. dividends.

That if considered advisable, a sinking-fund might be created for the gradual repayment of the debentures.

That shareholders might accept payment in debentures, and thereby ensure regular dividends and cheap gas, instead of continuing to risk their capital in ruinous competition.

And last, not least, that gas consumers could obtain their supply at a price not exceeding 6s. 8d. per 1000 feet.

It is unnecessary at this stage to shadow forth any scheme by which the City and Suburban Councils might purchase the works and carry on the manufacture and distribution of gas; that is a matter for the subsequent consideration of those desiring to participate in the benefits that may confidently be expected to arise from such a combination.

The following resolution was then unanimously agreed to:—

To the Chairman and Members of the Public Works Committee.

Gentlemen,—The sub-committee appointed by you to consider and report on the propriety or otherwise of the City Council exercising the powers contained in the Act 16th Vict., for the purchase of the City of Melbourne Gas and Coke Company's works, have the honour to report that, having fully considered the subject, they advise your committee to recommend the council to exercise the said powers of purchase at the earliest opportunity, and that the secretary of the gas company be informed of such intention.

ALEX. KENNEDY SMITH, Chairman.

The Public Works Committee subsequently reported to the City Council:—

"That with reference to the letter of the secretary of the City of Melbourne Gas and Coke Company, relative to the purchase, by the City Council, of the company's works, that a sub-committee, appointed to inquire and report as to the advisability or otherwise of exercising the powers of purchase conferred by the statute on the corporation, have collected much valuable information, which the committee recommend be printed, at a cost not to exceed £10, and furnished to the members of the council, with a view to facilitate further consideration of the subject prior to the committee submitting a further report."

HALIFAX CORPORATION GAS SUPPLY.

The *Halifax Courier* of the 16th inst. publishes the following letter addressed by Mr. Hawksley to the chairman of the Corporation Gas Committee:—

30, *Great George Street, Westminster, Sept.* 10, 1875.

Dear Sir,—I have just returned from a remote part of the Continent, and know nothing of the doings at Halifax in reference to gas matters.

I am acquainted with several gas-works which have been largely extended, not to say almost created out of undivided profits not brought into the capital account, and, therefore, standing in the books at a cost very much below that which has been really incurred. In some other cases, a system of nominal "writing off" has been used with a similar result; and, in a third set of cases, "premiums" have been applied to a large extent, whilst only share capital and borrowed money are retained on the debit side of the accounts. There are also other exceptional cases. In most of these cases the practices to which I have referred have been undeniably illegal, though (fallingly) justified on plausible grounds, for the most part based on the "custom" of prudent manufacturers in the management of their own private affairs; but which no trustees for others could safely adopt, and which is absolutely prohibited in the case of gas undertakings created and governed by statute.

If I build a mill I have a perfect right to discount the structure and machinery at any rate per annum I please, and (except for income-tax purposes) I may call my profits less by the amount thus written off, and I may, if I please, go on doing this till on the page of my ledger devoted to this operation very little of the original outlay remains. But suppose I want to go out of business, and you want to come into it, do I, therefore, allow you to take my mill and machinery at the value indicated by this paper operation; or do I, as a man of business, say "Oh, no; we must have the mill and machinery valued as a going concern at current prices." If I am justified in taking the latter course, what becomes of the page in my ledger? It no longer represents a fact, but, on the contrary, records the effects of a pleasant prudential delusion. I have been creating a paradise, but "a fool's paradise" for all that, since neither you, nor I, nor our executors, nor the Government will in the end pay the slightest regard to the wonderful page of the ledger, in which this (in more respects than one) "figurative operation" has been performed.

But let us now see what would happen in the case of a concern of many partners having a capital invested in mills and machinery, of say £250,000, making ordinarily a clear profit of 10 per cent., but writing off 5 per cent.

First year's capital	£250,000
Off	12,500
Second year's capital	£237,500
Off	11,875
Third year's capital	£225,625
Off	11,281
Fourth year's capital	£214,344
Off	10,717
Fifth year's capital	£203,627
Off	10,181
	£193,446

So that at the end of only five years I have written off nearly one-fourth of the original outlay.

But how does this operate on the profits divisible amongst the partners?

First year's gross profits	£25,000
Less	12,500
Net profit	£12,500
Second year's gross profits	£25,000
Less	11,875
Net profit	£13,125
Third year's gross profits	£25,000
Less	11,281
Net profit	£13,719
Fourth year's gross profits	£25,000
Less	10,717
Net profit	£14,283
Fifth year's gross profits	£25,000
Less	10,181
Net profit	£14,819

So that in the first year I, as a partner, receive only my proportion of half the profits, instead of my proportion of the entire profits, in order that future partners, in whom I have no interest, may receive a gradually increasing benefit after I have gone out of the concern. Now apply this to a gas-work, in which practically all the ratepayers are consumers, and all are partners, but in which the trade is not carried on with their money, but with money borrowed on their credit, not paying when they come into the partnership and not receiving when they go out of it. A. is a ratepayer in the first year—£25,000 profit is made, but by reason of the application of the "custom," he is allowed in his rates a share in only £12,500. B. is a ratepayer in the fifth year, and again a profit of £25,000 a year is made, and B., whose position is exactly that of A., is allowed to share in £14,819, but still not in £25,000. Has not A. been deprived of half his interest in order that B. may be bettered, and proceeding from B. to X., Y., Z., the ratepayers of remoter years, that these may be more and more advantaged at the expense of the ratepayers of the earlier years? This is precisely what the gas legislation provides against.

But this is only a partial view of the effect, because, instead of "the custom" of the manufacturer being wholly or in part a taking of money out of one pocket and putting it into the other—writing it off in the ledger and having it in the mill—we have here a case in which the money written off must go somewhere. It may go to the reduction of capital by actually paying off, or it may go into extensions, and so represent additional capital, in either case for the benefit not of A., but of B., C., D., and E., whose advantages will be greater and greater the further they are removed from A. Let us resume our calculations, and see how this will tell, taking interest on borrowed money at 4 per cent.

In the first place, if the capital be £250,000 and the gross profit £25,000, and the interest £10,000, then A. will be entitled to share in £25,000, less £10,000—£15,000 net. But that if the writing off plan be adopted, and £12,500 be written off, he will only share in £2500 instead of in six times that amount– continuing the process for only five years by way of example, then B., in whom A. has no interest (for A. has gone out by removal or death) will share in a surplus of £6670 instead of £15,000, the wrong done being greatest in the first years, but never entirely ceasing. Thus it is evident by the adoption of the manufacturers "custom" a very heavy burden will be—in fact, must be—imposed upon the present race of gas consumers for the benefit of a future race. This consequence Parliament has wisely provided against.

But in the case of the Halifax Gas-Works a gradual extinction of debt in another way has been prescribed, and this obligation presses very heavily upon the existing ratepayers. The two processes cannot in any view be necessary, and the combined operation of the two will add 8d. or 9d. per 1000 feet to the proper cost of the gas to existing consumers.

I am, therefore, entirely opposed to the adoption of the writing-off custom, both because it is illegal, and because it is unjust; but I am favourable to works being maintained at current expense in perpetually good condition as a going concern competent to the performance of all the obligations which are cast upon them. I may finally observe, in correction of another of the many prevalent errors, that, in all undertakings made perpetual by law, there is no such thing as so-called "deterioration," because the undertaking is perpetually undergoing renewal out of current income. The sole question in such a case is whether the undertaking is so properly maintained as a going concern as to be capable of affording the services to the undying public with a view to which it was constructed; it is no independent question whether this brick or that pipe is five years old or 50 years old, so long as out of the income this brick or that pipe is replaced as soon as it becomes unserviceable. "Dilapidations," by which is implied the neglect of timely repairs and replacement, is quite another matter, and is the subject of a deduction from the value of an otherwise "going concern." There are about your works some few actual dilapidations, but small in character and amount. These I considered.

I am, dear sir, faithfully yours,

W. Berry, Esq. T. HAWKSLEY.

MANUFACTURE OF SULPHATE OF AMMONIA.—A correspondent of the *Chemical News* says: "It may interest your many agricultural readers to learn that the back of an old prejudice regarding the colour of this important manurial salt is now in a fair way of being broken. Hitherto, almost the whole of the sulphate made for sale for agricultural purposes has been produced from brimstone acid, simply because it cannot be made of a 'good grey' from pyrites acid; this conventional stipulation as to colour being regularly made by all purchasers of the article. Impressed with the absurdity of using brimstone acid for an article destined to go upon the same land as soluble phosphate made from pyrites acid, a large English maker recently offered a consumer, with whom he had contracted, a reduction of 5s. per ton from his contract price if he would take a darker article made from the cheaper acid, but guaranteed equally rich in ammonia (24 per cent.), and equally free from sulphocyanides. The consumer being an intelligent practical chemist and manure maker, at once closed with the offer, remarking that he was not particular as to colour, so long as the article realized the two essential conditions named. Another firm have also since taken the darker tinted article at a similar reduction from their contract price. Agriculturists and manure makers, therefore, who are now paying the present high price for sulphate, would do well to acquaint the parties supplying them that they are prepared to forego the question of tint if this concession in price be made. It is high time that all such adventitious tests of quality as colour, mechanical condition, &c., should be discarded by intelligent men. Farmers are rapidly abandoning guano now that its per centage of ammonia is falling, whilst its fine brown colour remains. The colour test is equally worthless in the case of sulphate of ammonia. 'Good grey' has been bought by my own firm, which, in appearance, was unexceptionable, but which, upon analysis for ammonia, was found to be largely adulterated with white sand. Of course, the consumers of pure white sulphate for special purposes in the arts will still be able to get their requirements supplied by manufacturers who make a speciality of the article, and require an extra price for it. It is only the 'good grey,' for manure, now made so extensively from brimstone acid, which needs to be superseded by a cheaper, but equally guaranteed, make."

NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

[From the American *Journal of Gas Lighting.*]

The semi-annual meeting of the New England Association of Gas Engineers for the year 1875 was held in Lyceum Hall, Providence, R. I., on the 18th day of August last. There were about 26 members present. Several gentlemen, representing gas companies from other parts of the country attended by invitation.

The PRESIDENT (George D. Cabot, Esq.) occupied the chair, and at the opening of the session made a short address stating the object of the meeting, extending a welcome to the members and others who were present, and assuring them that he should do all in his power, as presiding officer, to make the meeting both pleasant and profitable.

The reading of the record being in the order of next proceeding, the secretary stated that he had sent copies of the *American Gaslight Journal*, containing said record in full, to all the members of the association who were not subscribers to that paper, thus giving them an opportunity to peruse an account of the proceedings at their leisure. He also stated that the record covered some 14 pages of his minute-book.

Voted, that for the reasons given by the secretary, the reading of the record be dispensed with, and that the same be approved.

A letter was received from Mr. Corliss inviting the association and guests to visit the works of the Corliss Engine Company at such time as should be most convenient.

Voted to accept the invitation with thanks. The forenoon of the following day was fixed for the visit.

A letter from Mr. J. P. Harbison was read by the secretary, expressing his regret at not being able to be present at the meeting, as he was then about to leave for a trip to Europe, and wishing, in conclusion, for the association a successful meeting.

An important letter from Mr. Gerdenier was also read, in which he gave some interesting facts and figures relative to his experiments with lime purification, suggested by the paper on that subject read by Mr. Forstall, of New Orleans, at the last meeting of the American Gaslight Association, which showed a very great improvement in purification, and a great saving of material and labour.

Voted that the above communication be placed on file.

The reading of the letter from Mr. Gerdenier led to a long discussion on the peculiar merits of Mr. Forstall's method of purification, from which it appeared that many of the members present, acting upon the suggestions contained in the paper referred to, had adopted in whole or in part that method, with good results.

The next subject taken up for discussion was the expediency, practicability, and economy of the use of coal tar as fuel for heating retorts.

Mr. Lamson, superintendent of the Boston Gas-Works, where the experiment has been going on for some time past on a large scale, being called upon, gave a very interesting description of the process employed by him, a statement of the relative cost of tar as compared with coke for such purposes, and also his opinion as to its economy and efficiency. This was favourable, although he wished it to be understood that his statements and opinions were not conclusive, his experiments not having, as yet, been so thorough or extended as to warrant a final decision on the merits of the peculiar process under consideration.

A short adjournment then took place, after which the discussion of the subject of the use of tar for fuel was resumed, and participated in by many of the members in a more or less informal manner.

By a natural transition the association passed to the consideration of the question whether there were not some methods in use by which coke for heating retorts could be rendered more available and more economical, by improved settings of benches. Among many methods mentioned was that recommended by Mr. Cathels, of Montreal, who claims to make a very great saving of coke by using his peculiar plan of settings. The per centage of coke used in each bench as compared with the quantity manufactured in the same bench according to statements given by many present, appeared to differ very widely in different works, some showing an incredibly small proportion, and some a quite large one, reaching in some instances to 60 per cent. This discrepancy must by caused by the use of different coals, or from carrying greater heats, or from inaccuracy in some cases in measurement.

It seemed, however, to be the opinion of those who took part in the discussion, that it is the imperative duty of the manufacturer of gas to adopt methods whereby the cost of the production of that essential article of use may be reduced to the lowest figure, that thus the manufacturer may be enabled to dispose of the same at a moderate price, whilst realizing reasonable profit for the risk incurred and the capital employed.

The next topic presented for consideration was naphthaline, its cause and remedy. From statements made during the discussion, it appeared that a large proportion of the companies are now, or have been, troubled, more or less, by this *abominable pest*, which manifests its presence in the gas by stoppage in the inlet or outlet pipes of the holders, in the mains and services in the street-lamps, and sometimes in the meters and fixtures in buildings. The question of interest, therefore, is, what preventive can be used, or what remedy can be applied?

Many causes were assigned and many remedies suggested; but there seemed to be no agreement in opinion among the members. All, however, agreed in this, that a generous use of Albert coal, or of the richest quality of cannel, was more likely than anything else to prevent the deposit of naphthaline, and to retain it until it reached the burner, where it could be beneficially used in improving the candle power of the gas.

Any one who will discover a simple, inexpensive, and sure cure for the evil, will be entitled to the warmest thanks of all gas engineers of companies suffering from this infliction.

The next topic introduced was ammonia, and how it may be removed without detriment to the gas. Remarks were made and facts presented by a few of the members; but the time being limited, no satisfactory conclusion was arrived at, and the subject was left open, to be treated more fully at a future time.

The adoption of the practice by many large manufacturing and business establishments, in various localities, of furnishing themselves with gas for illuminating purposes from their own works, thereby seriously affecting the business of regular gas companies, was then alluded to, and the question was very seriously put, whether it is possible or probable that the cost of producing gas can be reduced so as to regain, or at least retain, the business which has been, or may be, lost in the way just stated. No feasible plan seems at present to be available to counteract the evil, as gas companies are obliged to fix a price sufficiently large to cover, not only the cost of manufacture, but also the cost of distribution, with all incidental expenses for repairs, &c. Over and above all this, a sufficient margin must be reserved to allow a fair per centage of profit on the capital invested.

With private establishments, the only item of expense which seems to be taken into account is that of material carbonized, while the expense of wear and tear, and renewal, the interest on the cost of works and machinery, and in many instances the wages paid to workmen, are wholly ignored. It was quite refreshing and encouraging to learn, from some of the members present, that instances had come under their observation, where private gas-works had been abandoned, and gas from the public source had been again resorted to. In treating of the subject, the naphtha question received some little attention, but no great interest was manifested. Many companies which once adopted various naphtha processes, with the most sanguine expectations, have, one after the other, abandoned them; in many cases without assigning any satisfactory reasons for so doing.

Mr. Yorke, who has lately made an attempt to manufacture naphtha gas in connexion with coal gas, explained to the meeting the method employed by him and the results obtained. These results, he remarked, were so unsatisfactory, that the whole naphtha process was abandoned by him.

It seemed to be the opinion of the members of the association that the expectations of those who have tried the experiment of producing naphtha gas for general illuminating purposes, except, perhaps in a few rare and exceptional instances, have not been realized, and that further time and much care, thought, and patience must be expended before satisfactory results can be obtained.

The last topic considered, before adjournment, was the expediency and the duty of managers of gas companies, after ascertaining by experiment or otherwise, what is the most economical and best burner to be used for illuminating purposes by their respective consumers, to recommend the same for that purpose. One of the speakers stated that it had been his practice for some time, not only to recommend but also to provide burners for his consumers, suited to the gas furnished by his company, charging a reasonable price therefor.

Mr. C. S. Coldbach, of North Attleboro having been nominated by Mr. Rogers, of Jamaica, he was unanimously elected a member of the association.

In consequence of the intense heat, the evening session arranged for in the programme was dispensed with.

Mr. SLATTER, on behalf of the Providence Gaslight Company, extended an invitation to the association and guests, to meet at half-past eight o'clock on the following morning in front of the Aldrich House, where conveyances would be found ready to take the party to the gas-works, and other points of interest about the city, and then to the boat for Maxfields Silver Spring, where a clam bake would be provided.

The meeting adjourned *sine die.*

THE ESTIMATION OF NITRITES IN WATER.

By EDWARD NICHOLSON.

[From the *Chemical News.*]

There are two reactions, by the aid of which liberated nitrous acid may be estimated:—

1. The reducing action on potassium permanganate.
2. The reaction with potassium iodide.

The second reaction is by far the more sensitive; while 0·023 centigramme of nitrous acid in a litre of water only requires 0·01 centigramme of oxygen, yielded by 1 c.c. of the dilute standard permanganate solution, it liberates from potassium iodide 1·19 centigramme of iodide, a quantity sufficient for accurate estimation either volumetrically or colorimetrically. Besides the failure of the permanganate reaction (Péan de St. Gilles's process) in the case of minute quantities perfectly estimable by the iodide reaction, the former is masked or simulated by the action of organic matter. Dr. Paul recommends to use the permanganate after ridding the water of organic matter by alum precipitation and boiling; but I find this treatment will frequently leave, if not all the organic matter, at least sufficient to simulate much nitrous acid when none is present. Dr. de Chanmont proposes (Parkes's "Hygiene") a converse device—viz., to expel the nitrous acid by boiling the water after acidifying, and to take the difference between the quantity of permanganate now required, and that used without the boiling as indicating the amount reduced by nitrous acid; but it is evident, amongst other objections, that in few cases with the reaction with organic matter (already unsatisfactory in itself), either admit of such refinements or be clear enough for any value to be attached to the difference which may occur between the two experiments. But except in the case where sulphuretted hydrogen is present in water (and even then it can be removed), the well-marked and very sensitive reaction of nitrous acid on potassium iodide is always applicable. There are three processes available:—

1. *Volumetric Estimation by Arsenious Acid.*—This is an application of a well-known class of determinations; 198 of arsenious acid will absorb 508 of iodine, which amount is liberated by 12·2 of nitrous acid (12·5 is probably the more accurate figure, the proportion being as nearly as possible 40 to 1); it may be taken that each c.c. of a centinormal solution of arsenious acid (1·98 gramme per litre) will absorb the iodine liberated by 0·0125 centigramme of nitrous acid. I use the process in the following manner:—To 500 c.c. of the water, in a stoppered white bottle, add 5 c.c. of potassium iodide solution (one-tenth) and then 5 c.c. of dilute (one-tenth) pure sulphuric acid. Allow the reaction an hour for full development. If the iodine be liberated in very small quantity, or if it be masked by turbidity of the water, add a drachm of benzine or chloroform and agitate; the iodine will give it a pink colour which is quite as sensitive as the blue colour given by starch, and disappears more quickly when the iodine is absorbed. Under ordinary circumstances I use neither benzine nor starch, the yellow colour of the free iodine is sufficient. In order to estimate the iodine, neutralize the acid by a slight excess of sodium carbonate (caustic alkalies often contain nitrates), and drop in the centinormal arsenious solution until the iodine colour disappears.

2. *Mr. P. Holland's Colorimetric Process.*—This process is described in "Select Methods in Chemical Analysis." A solution of pure nitrite is prepared, containing 0·01 centigramme of nitrous acid in each c.c. A solution of iodine (about 4 grammes per litre) in potassium iodide is also prepared, and adjusted of such strength that 10 c.c. made up to 200 c.c. with pure water shall produce the same colour as 10 c.c. of the standard nitrite solution made up to 200 c.c. with water containing potassium iodide and some dilute sulphuric acid. The iodine reaction being developed in a certain quantity of water containing nitrites (as in the preceding process) an equal colour is produced in an equal quantity of pure water by the addition of the standard iodine solution; each c.c. = 0·01 centigramme of nitrous acid.

3. *A Simpler Colorimetric Process.*—Mr. Holland's process adds two standard solutions to those used in water analysis, besides giving the trouble of obtaining a pure nitrite. I dispense with these additions by the following simple process. It is founded on the liberation of iodine by a permanganate* under the same circumstances as its liberation by nitrous acid; 0·01 centigramme of active oxygen contained in 1 c.c. of the dilute standard solution of permanganate commonly used (0·395 gramme per litre) liberates 0·16 (more correctly 0·159) centigramme of iodine; while 0·01 centigramme of nitrous acid liberates 0·40 centigramme of iodine under the same circumstances. The application of this principle to colorimetric estimation is obvious; 0·01 centigramme of active oxygen contained in 1 c.c. of the dilute standard permanganate solution will, in a comparative experiment, liberate the same quantity of iodine as 0·004 centigramme of nitrous acid. Let the iodine reaction be produced, as in the first process, in 500 c.c. of the water under examination. When the colour is fully developed add in the same way potassium iodide and sulphuric acid to 500 c.c. of pure water, and then drop in the dilute standard permanganate solution until an equal iodine colour is produced. The development of the colour is immediate.

The first process is well adapted for laboratory work, especially as the arsenious solution is useful for other purposes besides water analysis. The third process is hardly less accurate; I devised it for use while travelling in India, in order to reduce the number of standard solutions carried about.

* This reaction has, I need hardly say, nothing to do with the action of permanganate on nitrous acid.

NOTES ON COAL GAS POISONING.

By Mr. J. Hepworth, of Carlisle.

[A paper presented to the last meeting of the British Association of Gas Managers, and published in their "Transactions."]

Instances of coal gas poisoning, causing the temporary disablement of a workman, have probably come under the notice of most of those who have the charge of gas-works; and instances of death arising from the inhalation of coal gas, unhappily, are not unknown, and can scarcely be said to be uncommon; a case in the town in which we are met (Leeds) having taken place in 1870, by which four persons lost their lives; and other instances, in other places, have occurred more recently.

The latest case that has come to my knowledge, and, in some of its features, perhaps the most peculiar, is one which has recently occurred in Carlisle. At the time of its occurrence I was not aware of a parallel case, and it seemed to me, therefore, that some notes of this case, while of more especial interest to the medical profession, might also possess some interest to the members of this association.

The circumstances are these:—A man-servant at an hotel retired to bed from twelve to one o'clock a.m. on the 26th of April last. The man was described as a healthy, well-formed, muscular man of about 20 years of age. He slept in a room measuring 15 feet by 9 feet by 10 feet 6 inches, and containing, therefore, about 1400 cubic feet of air. The door and window of the room were close-fitting, and there was no fireplace or other means of ventilation. The room was lighted by a 2-light water-slide gaselier. This was found drawn down to its lowest point (5 feet 6 inches from ceiling), and from its defective condition, and also from an insufficient supply of water in the tube, must have permitted an escape of gas the whole of the time it was in that position (probably the whole night).

The man was supposed to have slept for eight hours when a fellow-servant went to awake him, and, receiving no answer, opened the door and entered the room. He found a very strong smell of gas, and *one light of the gaselier burning at full flame*. The man was lying in bed, as he had evidently retired, and was in a state of *coma*, or, in the words of his fellow-servant, "the man was snoring, breathing very hard, and apparently in a deep sleep," from which he could not rouse him.

In this condition the man remained for 68 hours, the pulse was rapid (150), the temperature of the body ranged from 102° to 106°, and the breath smelt of coal gas. Various remedies were adopted, some with temporary relief to the system—including the inhalation of oxygen gas—but, at the end, the man died, having remained unconscious the whole time.

On first hearing of the case it did appear to me to be a most unlikely thing that, in a room in which a naked light was burning, and a sufficiency of gas escaping to render a man unconscious, and, in conclusion, to cause death, *an explosion of gas should not have taken place*. Yet such was the case.

A knowledge as to the composition of the atmosphere of the room when entered would be of some value, but the quantity of gas emitted from the gaselier must remain uncertain.

Assuming, however, that 6 cubic feet of gas per hour had escaped, or even 12 cubic feet (a most improbable quantity), we have, at the end of eight hours, 48 cubic feet of gas to 1352 cubic feet of air, or 1 part in 28, say 3·56 per cent. in the one case, and in the other, 1 part in 14, or say 7 per cent. of gas—proportions not known to be explosive. The most explosive mixture being 1 in 9, or about 11 per cent. of gas.

I have endeavoured to ascertain if a similar case has been recorded. I have met with none in this country; and the only instance, so far as my knowledge extends, is one which occurred in Strasbourg in 1841, where four out of five persons lost their lives, the result of breathing for 40 hours an atmosphere contaminated with coal gas, in a room in which a stove had been for a long time in active combustion, and a candle had been completely burnt to its end.

It is not necessary here to refer either to the average composition of ordinary coal gas, or to the products of the combustion of that gas vitiating the atmosphere; and it is beyond the immediate scope of this paper to inquire as to what elements constitute a poisonous atmosphere; but Dr. Alfred Swaine Taylor, lecturer on medical jurisprudence, speaking on this point, gives it as his opinion that an admixture of 9 per cent. (*i.e.*, less than an explosive proportion) of coal gas in the atmosphere may destroy life if long breathed. In the case I have related, there certainly could not have been more than 7 per cent., and probably there was less than 3½ per cent.; but a case, ending fatally after eleven hours inhaling, has been recorded by Dr. W. Taylor, of Edinburgh, where he supposes there could not have been more than 3 per cent. of coal gas in the atmosphere.

The fact is, therefore, established, that even in the presence of a flame there may be an atmosphere impregnated with coal gas to such a degree as to produce death without causing an explosion.

Now, as every one here is well aware, it is sometimes necessary, during the repairs of a gasholder or other apparatus, for the men employed to remain for some considerable time in an atmosphere much more vitiated than any of those referred to; and, since writting the above, there has come under my notice an invention, known as the "Denayrouze Patent Respirator," which I need make no apology for referring to.

This instrument seems to afford the utmost security in the most poisonous atmospheres, and has been used, I understand, at the Phœnix Gas-Works this year. The respirator is said to consist of "a hard, light, but very flexible tube, with india-rubber mouthpiece, by which air can be inhaled from any distance, while a valve permits the escape of the products of respiration." There is also provision for the protection of the eyes, combined with an elastic nose-clip, effectually preventing the entrance through the nose of noxious gas to the lungs. With an instrument of this character there is no longer occasion to suffer the slightest inconvenience or danger to attend any of the operations we may have to undertake.

These brief notes, I trust, may not be without value to those who are engaged in the manufacture of gas, and whose responsibilities have to do not only with the successful conduct of their several works, but also with the preservation of the lives, as well as the property, under their charge from all unnecessary risks of danger.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The week has again been a very quiet one in trade circles, so far as actual transactions in both raw materials and finished iron are concerned. Pig irons are rather cheaper, owing to the large quantity of Cleveland and general north country brands which have just become available for the home market owing to the closing of the Baltic navigation. The weaker condition of the Scotch pig-iron market has also, in a certain degree, contributed to the drop, although there is now said to be a very good amount of business doing in the Glasgow brands. The agents for the North Yorkshire houses are now quoting the following figures as approximate for sales:—No. 1 foundry, 56s.; No. 2 foundry, 54s.; No. 3 foundry, 51s.; No. 4 foundry, 50s.; No. 4 forge, grey, 49s.; No. 5 forge, mottled, 48s.; No 6. forge, white, 47s.; refined metal, 70s.; Kentledge, 57s.; and cinder pigs are at their normal price of 40s. per ton.

Hematite pig irons are also weaker, in one or two instances to the extent of fully 2s. per ton.

Merchant irons have been in very poor request at prices which must be accepted as being wholly nominal. Bars of common descriptions are still quoted at £8 per ton; medium kinds at all the figures intermediate between £8 15s. and £10, and good Yorkshire bars at £12 to £12 10s. Hoops are selling with a little more freedom. On Wednesday afternoon almost all the district iron and steel works were flooded, owing to the overflowing of the rivers Don, Rother, Sheaf, and Porter. There had been some 50 hours incessant rain, which so rapidly ran off the gathering-grounds, that these streams were at once swollen, and spread over the low-lying lands contiguous to their banks. The damage done to house property, works, &c., is immense, the gas companies at various towns and villages having no little reason for complaint, the mains having been entered by the water. Railway lines in the valley of the Don are washed away, or are still 5 or 6 feet under water.

The coal trade remains in a fairly brisk condition, although many of the pits are flooded by the surface water or by infiltration. House coal is not really dearer, but quotations have an upward tendency. It is not thought likely the manufacturing fuel will become dearer prior to the advent of December at the earliest.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The prospect of an advance in the price of coal, consequent upon the agitation among the colliers for an advance in the rate of wages, which has not by any means subsided, has this week given a decidedly firmer tone to the local iron market. Prices have not at present been affected to any extent, but makers generally decline to enter into contracts at current rates. Branded iron is unaltered, but the commoner qualities show considerable strength, and it is now difficult to place an order for unmarked bars under £8 per ton. Transactions are also reported in iron ores and pig iron, at prices ranging from 1s. 3d. to 3s. 6d. per ton higher than the rates ruling a fortnight ago. The mills and forges are, as a rule, in moderately steady operation, but are chiefly engaged in the execution of orders received on quarter-day, the new orders coming in being of unimportant extent, and it is generally believed that a slack trade is impending. Sheets continue in leading demand.

A meeting of the coalowners of the Cannock Chase district was held in Birmingham on Thursday last to consider the question of prices. No particulars of the discussion have been permitted to transpire, but the meeting was ultimately adjourned for a week. As the Cannock Chase firms usually take the lead in the matter of prices, the movement is regarded as sufficiently ominous by the representatives of the iron trade, who are almost unanimous in the opinion that any forced advance in the price of iron would just now seriously injure the trade.

The heavy rainfall of the past few days has greatly restricted operations both in the iron and coal trades. Many of the collieries are completely flooded, and it is estimated that the output of coal in the South Staffordshire district will this week be as much as 100,000 tons below the usual weekly average, and many of the iron-works being in close proximity to collieries, depend upon daily supplies of fuel, and are thus compelled to suspend operations.

Coal is firm, but not quotably higher.

At Wednesbury the wrought tube and fitting trades are steadily improving, and labour disputes are once more in the foreground.

The men employed in the fitting department of Messrs. Knowles's works, who have for some time been on strike against a reduction in wages, are now proposing to establish a small works on the co-operative principle, and it is stated that the project is likely to be successfully carried out.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The change in the weather is having a perceptible effect upon the demand for house coal, which is not nearly so plentiful in the market, whilst prices are stiffer; and it is probable that this branch of the coal trade will be brisk for the next month or so, until consumers have taken in their winter stocks, when a lull may be again expected. In the Manchester district, the large colliery proprietors are getting behindhand with their orders, and stocks of best coal have been considerably reduced. The canal wharves round Manchester are also doing a large trade, and consumers and merchants in the outside districts are buying freely. In the large coal-producing districts very much the same state of things prevails. The best classes of coal are moving off freely at the full list rates, and in many cases new customers have to pay more money than last month. In the Wigan district it is not improbable that an advance of 1s. per ton in best coal may be made at the end of the month, unless the weather should become very much milder, and this is already being obtained in some quarters. In other classes of fuel, such as furnace coal, burgy, and slack, there is not much improvement to report. There is a steady market at about late rates, but supplies are still generally tolerably plentiful, and no upward movement in these descriptions of coal is looked forward to.

In the gas coal trade a few more inquiries are reported in the market, but no new business of any real importance is being done, and prices in the Manchester district remain without any material change.

The shipping trade is very dull, and there is still some competition for orders in the common classes of coal.

For coke there is still only a very poor inquiry, and prices are weak.

The iron trade in the Lancashire district continues very dull, and prices are being quoted very low, No. 3 Middlesbrough foundry pig iron being offered for delivery over a few months at 58s. 6d. per ton, or a little less where a good order is to be secured; No. 4 at 57s. 6d.; and No. 4 forge, 56s. 9d. per ton. In Lancashire makes of pig iron there is no material change to notice. Bar iron is again a little easier, common qualities being offered at £7 17s. 6d. per ton delivered; puddled bars are also weaker, being quoted at £5 8s. 6d. per ton; and the same remark applies to rails, which are offering at £7 12s. 6d. to £7 15s. per ton for light sections delivered, and from 5s. to 10s. per ton less for heavy sections.

Founders are now complaining that the few orders they had on hand are running off, with very little fresh business coming in; the forges are only moderately employed, and the engineers in this district have been discharging a considerable number of hands.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The coal trade of the North of England was in an extremely abnormal state last week. From Saturday night until Friday forenoon there was not a single sailing from any of the coal ports, and on the latter mentioned day only 30 coasting steam colliers proceeded out of the Tyne. The trade of this port has not been so continuously blocked with stormy weather for a considerable time as it was last week. The rivers and docks have been quite crowded with vessels, and there is a large fleet of laden coasters which have been accumulating in the coal ports during the past fortnight, which are now only waiting a favourable turn of the weather to get to sea. Gas coals have been held very firmly at recent quotations—namely, at from 8s. to 11s. per ton. The tone of the household coal trade is stronger, and if this week the sea should be more tranquil, and the ports should reopen for outward business, there will be a very active shipment of these sorts of coal. There is also a very considerable quantity of gas and household coals on board the vessels lying here windbound. The general impression in the North of England is that gas and household coals will maintain their present rates. But steam coals, which have been reduced 2s. per ton, it is anticipated, will get lower, and there is no demand for manufacturing coals.

Most classes of coal freights advanced last week. There was a rise in coasting

and French rates of from 5s. to 10s. per keel. Foreign freights have likewise improved a little. It is quite probable that these advances will be maintained for a period at least. There is an abundance of steam tonnage in the coal ports, but a scarcity of small sailing ships.

The iron market of Cleveland was flatter last week, and prices of all kinds of pig iron, except forge qualities, were lower. Shipping business is necessarily falling off, as the Baltic ports begin to close, and that throws more iron upon the home market. There is no improvement in the finished iron trade, which could not well be worse. The coke business of South Durham is also very poor.

The chemical trade of the Tyne is getting worse instead of better, and prices were slightly lower last week than the week before. There will either have to be a reduction of wages in this trade, or else a considerable reduction of business operations, as manufacturers cannot go on losing money in the way they are doing.

The general manufacturing trade of the Tyne and Northern districts is far from satisfactory for the winter. The shipping demand for fire-bricks and fire-clay goods is falling off as the Baltic business begins to close, and they are more abundant than they were a month ago, with quicker shipments. All kind of building material, however, is well maintained, and, as there has been a considerable destruction of timber vessels in their passage across the North Sea during the late gales, it is quite probable that the price of deals will advance.

The recent storms have not done much damage to coasting ships usually employed in the gas coal trade. The greater number of vessels that have been wrecked have foundered in the middle of the North Sea, and have been foreigners.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

In order to have an abundant supply of gas for the large district over which the pipes connected with the Newton-on-Ayr Gas-Works extend, the gas company have recently erected a large additional gasholder, which will enable them now to meet their requirements with the greatest ease. It is capable of holding nearly 20,000 cubic feet of gas. The ceremony of turning the gas into the new holder took place on Thursday week, in presence of a number of the directors, and a few friends, the chairman of the company (Mr. James Ferguson) doing the honours of the occasion. After the ceremony, he expressed the gratification of the directors in having been able to carry out this addition to their works in such a successful manner. He complimented the manager (Mr. Smith) on the great amount of attention which he had devoted to this extension of the company's works, and to his general successful management of all that was confided to his care. He also referred to the recent reduction in the price of Newton gas, and hoped that the additional accommodation they had now secured would enable them to supply enough gas of a quality which would leave no ground for complaint. The company afterwards adjourned to the Royal Hotel, where they partook of luncheon.

The annual gas accounts of the Town Council of Rothesay have just been published. They show a balance in favour of the town of £512 0s. 11½d., and the Gas Committee have recommended that £200 be voted to the police accounts in name of repairs to the roads for the last ten years, and that £20 be voted yearly for the same purpose. On a division, at the last meeting of the Town Council, it was agreed, by 13 to 4, that the £200 should be transferred, but that the sum of £20 should not be fixed as a yearly grant. The gas revenue for the past year was £4138 16s. 1d.; the expenditure (including grant of £200 to police), £3447 19s. 11d. leaving a balance of £302 0s. 11½d. which goes to the reduction of debt.

At a meeting of the Town Council of Edinburgh, held last Tuesday, the Lord Provost's committee recommended, under the remit recently made on Councillor Mossman's motion, that Mr. J. Falconer King be appointed gas analyst for the city for six months. The recommendation was agreed to. Mr. King is also the public analyst for the city under the Adulteration of Food Act.

The Edinburgh and District Water Trust have accepted the offer of Mr. Young, contractor, Barrhead, to make the pipe track from the Edgelaw compensation reservoir to the Alnwick Hill distributing reservoir, which is about 4000 yards from the city, the contract price being £17,693. The pipe track, which will be about 15,000 yards in length, is to be occupied partly by 24-inch and partly by 22-inch cast-iron pipes.

An interim report has been made by Messrs. Leslie, Edinburgh, upon the proposal to obtain an additional supply of water from the Devon Valley for the town of Dunfermline. They have reported on two alternative schemes—one to supply one million gallons per day, at an expense of from £60,000 to £70,000; and the other to supply three-quarters of a million gallons, at an expense of from £40,000 to £50,000. Messrs. Leslie have been instructed to complete their surveys, and to prepare their estimate on the understanding that a million gallons should be supplied daily.

The Largs Local Authority are at present engaged in the consideration of several water schemes, submitted to them by Mr. Gale, of Glasgow. The Irvine authorities have just received a report from Messrs. Leslie regarding a water scheme, the probable cost of which would be £24,000. The local authorities of Ardrossan, Kilwinning, and Stevenston are to be asked to join in the undertaking.

In order to get out of the difficulty into which they have got through their pipe contract, the Dundee Water Commissioners have agreed to ask Messrs. Harrison and Hawksley (the president and past-president of the Institution of Civil Engineers) to examine and report to them upon the whole works.

There is nothing particularly notable in regard to the pig iron trade. Business was done on Friday at 60s. 6d. cash.

No new feature has shown itself in the coal market. Bad trade is being felt very keenly, and orders are getting very scarce. Some coalmasters appear to be quite abreast of their contracts, and anticipate a dull winter. House descriptions are most inquired for, and prices are rather firm. Shipping was busy during the past week in the East ports, and on the Clyde the cranes were kept going pretty well, but they are not fully employed.

SAN PAULO GAS COMPANY.—The directors have declared an interim dividend at the rate of 6 per cent. per annum for the six months ending June 30 last, payable on the 25th inst.

WALSALL GAS SUPPLY.—A special meeting of the Walsall Town Commissioners was held on Wednesday last, for the purpose of authorizing the commissioners to carry out the arrangements necessary to complete the transfer to the Walsall authorities of that part of the plant and property of the Birmingham and Staffordshire Gas Company, which is within the borough of Walsall. The town-clerk explained that although the Town Council had already received authority to take all the steps necessary to complete the transfer of the property, counsel had advised that this meeting should be held, and that advice had been taken. A resolution was, therefore, carried, authorizing the commissioners to promote the bill for the carrying out of the transfer, and in favour of paying all the costs thereof out of the gas-works capital account, or other public funds or rates under the control of the commissioners. Further, the clerk was authorized to take all necessary steps for promoting the said bill; and the whole of the commissioners were appointed a Parliamentary Committee, with full powers to decide all matters in relation to the said bill, and to confer with and direct the clerk thereon. A town meeting was held on Friday evening, at which a resolution, confirming the decision of the commissioners, was adopted.

CHARGE OF CONSPIRACY BY GAS STOKERS.—On Friday last, at Newcastle, Staffordshire, three stokers, named Leech, Johnson, and Cornwell, in the employ of the Newcastle Gas Company, were charged under the Master and Servants Act with conspiring to cause the company to break their contract with the corporation for the lighting of the public lamps of the town. Mr. Dutton, solicitor, who appeared for the company, said the whole of the men had systematically done all in their power to prevent the company from keeping up their supply of gas. They had regularly neglected the retorts, and allowed the gas to escape, so that on several occasions the streets were almost left in darkness, and the company had fallen into great disrepute. On the previous Saturday night very many thousand feet of gas were allowed to escape. The evidence would leave no doubt that all the workmen had combined, and the company wished to make an example of the defendants. Mr. Welsh, solicitor for the defence, objected to the jurisdiction of the magistrates, and said he wished the defendants tried before another tribunal. Mr. Dutton said in that case he could not proceed before the magistrates, but he would indict the defendants at the quarter sessions. Of this course Mr. Welsh expressed his approval.

FYLDE WATER-WORKS COMPANY.—The half-yearly general meeting was held at the company's office, Kirkham, on the 14th inst.—Mr. F. Kemp in the chair—when the following report of the directors was presented and adopted:—"*Capital Account:* The last statement submitted to the shareholders showed the expenditure on capital account to be £108,482 7s. 6d. The payments on this account during the six months ending Aug. 31, 1875, amount to £11,649 14s., making a total to that date of £120,132 1s. 6d. *Revenue Account:* The annexed statement of accounts for the six months ending Aug. 31, 1875, shows the amount received for water, &c., to be (including balance of £192 14s. 3d. from last account) £5421 4s. 9d.; less interest on loans and commission, £472 9s. 8d.; working expenses £1456 17s. 3d.; leaving a balance of £3491 17s. 10d. The increase in the revenue is very satisfactory, and all the works are in good condition. The number of houses supplied with water is 4937, being an increase of 289 during the past six months. The directors recommend that out of the balance the sum of £2925 be applied in paying a dividend at the rate of 6½ per cent. per annum, free of income-tax; £400 in increasing the reserve-fund; and that £166 17s. 10d., the residue, be carried forward to the next account. Since the last report considerable progress has been made with the puddle-trench for the new Barnacre reservoir, and no difficulties of importance have been met with. A new main to St. Ann's-on-the-Sea has been almost completed. The new Fleetwood main, it is expected, will be finished in a few months. Before next spring the directors intend to lay an additional main from Layton Hall to the North Shore, Blackpool, to improve the water supply there. For the purpose of simplifying the keeping of the books and future dealings with the capital, the directors recommend the shareholders to follow the example of other companies and convert the share capital of the company into stock. At present the capital consists of £60,000, in shares of £10 each, on which the dividend by the company's Act is limited to 10 per cent. per annum, and £30,000, in shares of £5 each, on which the dividend is limited to 7 per cent. per annum. The dividend on all future capital that may be issued is also limited to 7 per cent. per annum. The suggestion is that the £60,000 should be converted into stock to be called 'Consolidated Stock A,' and the rest into stock to be called 'Consolidated Stock B.' The directors, in accordance with the intimation contained in their last report, now recommend the increase of the capital of the company by the issue of £36,000 'Consolidated Stock B,' to be offered, in the first instance, to the present shareholders at par, in proportion to their several interests."

WEST'S MECHANICAL STOKER.—In a report which has just been made to the directors of "West's Gas Improvement Company," Mr. R. P. Spice, speaking of a special visit paid by him to the Maidstone Gas-Works, says: "I found the drawing of the charge from each retort, by means of West's apparatus, was effected on an average in 20 seconds, the variation between the several drawings not exceeding 3 seconds, the time being taken at the moment the rake was put into the retort, and determined at the instant it was removed to the next. The operation of charging followed immediately upon the drawing being completed, and the drawing apparatus removed to the next retort on the same level, and was accomplished on an average in 27 seconds, the time being taken when the little waggon with its charge of coal entered the retort, and again when it had been withdrawn and the stage carrying it was removed to the next retort in line and the lid put on and screwed up. The whole contrivance struck me as being beautiful in its simplicity, the mechanical principles sound, the liability to derangement remote, the details such that any repairs can be easily effected by a workman of ordinary ability, such as would be met with in any smith's shop, and the way in which the work was done was quiet, orderly, and neat; no hurry, bustle, or fast driving to produce an effect, but evidently in the regular every-day style; and it certainly afforded me great pleasure to witness such a vast improvement upon the old *blood, muscle, and bone* system, which, in comparison with this new method, can only be regarded as a form of slavery, making large demands upon the powers of physical endurance of the workmen employed, using the old drawing rake and charging scoop. As regards the character of the coke produced, its bulk being increased, of course, is a proof which cannot be gainsaid that it cannot be so *dense* as that produced on the old plan; but this, under ordinary circumstances, is no drawback, but, on the contrary, a positive advantage. And finally, as to the quantity of gas produced and its quality: the improved results are such as all rational, well-informed men would expect from working off charges of coal deposited *evenly* and in *a thin layer* on the bottom of the retort, in two-thirds the time requisite to carbonize the same quantity laid in a thick mass, not evenly or uniformly deposited; and briefly, those which I found were 10,300 feet of 16-candle gas obtained from Holmside coals. I will only add that I shall certainly take the earliest opportunity I may have of giving practical proof of my good opinion of the invention by introducing it in the course of my practice, and heartily wish the inventor and the shareholders in the undertaking great success, which I consider they richly deserve."

COVENTRY GAS-WORKS.—PROPOSED PURCHASE BY THE CORPORATION.—At the meeting of the Common Council of this city on the 19th inst., Mr. Hodgkinson brought forward the question of the purchase by the corporation of the works of the Coventry Gas Company. He hoped, he said, the members would disabuse their minds of all prejudice and all self-interest in approaching the question. Those who had been to Manchester, and seen the great public improvements which had been effected in that city, would perhaps be surprised to hear they had been paid for out of the profits which the corporation had made from the making and selling of gas. What had been done there had been also done on a smaller scale in other towns, as Bradford, Leeds, Rochdale, and elsewhere. He had collected returns from a large number of towns, and he found that the gas produced by corporations was generally of a high illuminating power, while the price had been reduced. At Burnley the illuminating power of the gas was 17 candles, and the price 3s. per 1000 feet. At Bolton the power was 18, and the price 3s. 6d. At Carlisle the power was 18, and the price 3s. At Darlington the power was 15, and the price 3s. 6d. to 4s. At Glasgow the power was 25 to 27, and the price 5s. 5d., and at Manchester the power was 18 to 20, and the price 3s. 8d. Then as to profits, he found that at Bradford during the last three years they had realized a profit of £25,975. At Burnley, last year, the profits amounted to £3900. At Carlisle, last year, £3000. Darlington had made as profit on their gas supply £22,600. Glasgow £87,245, on £291,147; and Manchester £77,465, on £355,681. He contended that what other towns had done Coventry could do, and ought to do. He trusted that there would be no apathy, but that the council would resolve to procure for the people of Coventry a good light at a cheap rate. He moved that in the opinion of the council the manufacture and supply of gas ought to be in the hands of the

corporation, and that a committee be instructed to negotiate terms for the purchase of the undertaking of the Coventry Gas Company, and to employ such professional and other assistance as they may deem necessary, and to report the same for the approval of the council. Mr. London seconded the proposition. A number of members objected to the terms of the resolution, as committing the council to a definite opinion, before due inquiry had been made. Ultimately Mr. Hodgkinson withdrew his resolution, and seconded the following one proposed by Alderman Hill:—"That the subject be referred to the General Works Committee, who shall inquire whether it is desirable that the supply of gas shall be in the hands of the corporation, and to report to the council thereon." This was unanimously adopted.

LEWES WATER-WORKS.—It affords us pleasure to state that the works which have for some time been in course of construction by the water-works company are completed, and that both the engines now pump direct from the new well. No exception can be taken either to the quantity or quality of the water, and both the inhabitants of Lewes and the directors of the water-works company are heartily to be congratulated upon the successful result of the efforts made by the latter to accomplish that object. An engineer, who has visited the works this week, supplies us with the following particulars:—The engine used for pumping was erected in 1869, and is capable of being worked up to 50-horse power, when forcing into the highest reservoir. It has two cylinders, one high pressure, 16 inches diameter, and one low pressure, 28 inches diameter. The steam is first taken from the boiler and used for the high pressure, passing from thence to the low pressure, and after being used the second time, is condensed and returns to the boiler to be used over again. By this arrangement much fuel is saved, which, to the shareholders, must be a great consideration. The stroke of this engine is 4 feet 6 inches, the fly-wheel is 18 feet diameter, and weighs 8 tons 16 cwt. The beam is made of two wrought-iron plates, each 1¼ inch thick. Connected with the beam are two plungers, 13 inches diameter—the one nearest the centre of beam throwing about 350 gallons, and the one farthest from centre about 450 gallons per minute. There is an older beam engine in an adjoining engine-room, of 25-horse power, erected in 1863, which has a stroke of 3 feet, used in case of repairs being required to the more powerful engine. The cylinders of this engine are 12½ inches for high pressure, and 15 inches diameter for low pressure, and in them the steam is utilized as explained above. It has a fly-wheel 16 feet diameter, and is capable of pumping about 400 gallons per minute. In the same room with the smaller engine is a 3-throw pump, also capable of pumping 250 gallons per minute. To supply the steam power, three boilers are provided, but only one is used at a time, so that repairs can be made to each without stopping the engines. Much care and foresight appear to have been used in planning this pumping station; so that there is little fear of any breakdown occurring through accidents, for if one engine failed, others would be used while repairs were being made, and the same remarks apply to the arrangement of boilers. The supply of water is inexhaustible, for when pumping 1050 gallons a minute, the water in the well stands at 12 feet below ground level, and when pumping ceases, it rises until within 5 feet of ground line, at which level it stops. Great praise is due to the directors, the engineering contractors, and the obliging manager, for the care shown in all the working arrangements of these works.—*East Sussex News.*

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

3579.—LYTTLE, W. A., Hammersmith, "Improvements in the means and apparatus for deoxidating metallic ores, oxides, and sulphates, which improvements are equally applicable to the coking, 'charring,' and destructive distillation of any solid organic matter, to the calcining of metallic ores, and to the production of carbonic oxide flame." Oct. 15, 1875.

3587.—RAMMELL, T. W., Westminster, London, "Improvements in centrifugal machines for throwing air and other fluids, and communicating motive power thereby." Oct. 15, 1875.

3601.—CHANDLER, S., jun., Southwark, London, "An improved arrangement or regulator for gas lights, whereby a more perfect combustion is attained." (Complete specification.) Oct. 16, 1875.

3605.—FLOYD, J. N., Handsworth, Stafford, "Improvements in direct-acting steam-pumps." Oct. 16, 1875.

3615.—ABEL, C. D., Southampton Buildings, London, "Improvements in engines worked by gas and air, and in their application for raising or forcing liquids." A communication. Oct. 18, 1875.

3625.—CLARK, A. M., Chancery Lane, London, "Improvements in water-meters." A communication. (Complete specification.) Oct. 19, 1875.

3668.—SLATER, J. W., Tamworth Terrace, London, "Improvements in the treatment of sewage deposits or precipitates, or sewage sludge, in order to obtain therefrom ammonia, illuminating gas, and other useful products." Oct. 21, 1875.

GRANTS OF PROVISIONAL PROTECTION.

3303.—BELL, A. P., and THORP, T., Manchester, "A new and improved apparatus for lighting gas automatically." Sept. 21, 1875.

3316.—BARTRUM, W. E., Streatham, London, "Improvements in rotary engines, pumps, or meters." Partly a communication. Sept. 22, 1875.

3326.—SAXBY, F. E., Liverpool, "Certain improvements in valves to be used for the purpose of regulating the supply of steam, compressed air, or water to engines or machines driven by either of the above forces." Sept. 23, 1875.

3334.—SUGG, W. T., Westminster, London, "An improved apparatus for indicating the illuminating power of gas." Sept. 24, 1875.

3372.—BOYD, W., Forest Hill, London, "Improvements in apparatus for lighting and heating." Sept. 27, 1875.

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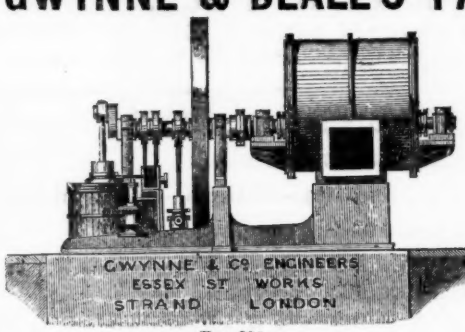

FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

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The oldest Maker, Inventor and Patentee of GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

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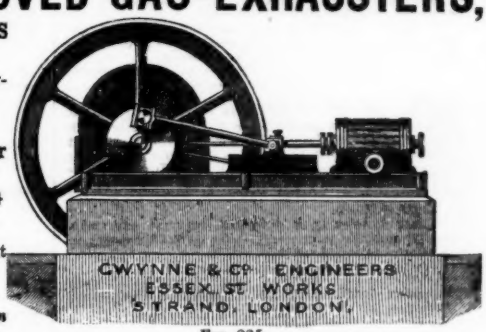

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND CO. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
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GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

WANTED, by the Advertiser, a situation as CLERK and Collector, or Assistant Clerk and Meter Inspector. Well acquainted with keeping Gas Companies Accounts. Good references.
Address No. 204, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, the Management or Assistant Management of a Gas-Work. Five years practical experience in the manufacture and distribution of gas.
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TO GAS COMPANIES AND GAS ENGINEERS.

WANTED, by a Gentleman, a situation as ASSISTANT ENGINEER or Draughtsman, either in a Gas-Works or Gas Engineering Works. Thoroughly conversant with all the details, having had much experience in designing, superintending the construction and erection of new Gas-Works, Apparatus, &c.; also extensions and alterations of the same. Is a good draughtsman. Can prepare working drawings, quantities, &c. Over 14 years experience with an extensive Gas Engineering Firm. First-class references or testimonials.
Address G. E., care of Mr. W. W. Thomas, 7, Westminster Chambers, Victoria Street, WESTMINSTER, S.W.

FOR SALE—Sundry Gas Apparatus, comprising two holders, in wrought-iron tanks, purifier, condenser, 50-light meter, and other parts. Suitable for a small Gas-Work.
For further particulars and price apply to W. H. BECK, 139, CANNON STREET, E.C.

NEW EDITION, NOW READY,

ADVANTAGES OF GAS FOR COOKING AND HEATING.

By MAGNUS OHREN, A.I.C.E., F.C.S.

For Companies to issue to their Gas Consumers.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

WANTED, GAS-WORKS TO LEASE.

THE Engineer of a Work of acknowledged repute is desirous of LEASING a small work. Can offer unusual advantages to companies or proprietors whose undertakings are unremunerative, or have fallen into a dilapidated condition.
Address No. 202, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GASHOLDER MAKERS.

THE Rossendale Union Gas Company are prepared to receive TENDERS for the erection of a 150 ft. GASHOLDER, single-lift, 30 ft. high, with columns, girders, &c., at their works, Clough Fold, near Manchester.
Plans and specifications for the same may be seen at the Company's Office, Clough Fold, on and after Friday, the 22nd inst.
Sealed tenders to be addressed to the Chairman of the Company, on or before the 3rd day of November next.
WM. BLACKLEDGE, Manager.
Oct. 15, 1875.

TO GAS CONTRACTORS AND ENGINEERS.

GAS CONCESSIONS in the South of Europe for SALE. Principals alone treated with.
Address Mr. WARWICK, Accountant, 25, Bucklersbury, LONDON, E.C.

TO GASHOLDER MAKERS.

THE Oldham Corporation Gas and Water Works Committee are prepared to receive TENDERS for supplying and erecting one Telescopic GASHOLDER, 100 ft. diameter, at their Hollinwood Gas Station.
Plans and specification may be seen on application to Mr. Herbert Andrew, Gas and Water Offices, Oldham.
Tenders to be sent in on or before Tuesday, Nov. 9, 1875.
The lowest or any tender not necessarily accepted.
By order,
H. BOOTH, Town-Clerk.
Oldham, Oct. 19, 1875.

TO GAS ENGINEERS.

THE Engineer and Manager of the Blackburn Gaslight Company lately having died, the Directors of the Company are open to receive APPLICATIONS from thoroughly qualified persons for the appointment of ENGINEER and General Out-door Manager of their several works.
Whoever is appointed will be required to reside in the town, and to devote his whole time to the duties of the Office.
Applications, stating salary required, and date when applicant can enter on his duties, to be sent, with testimonials, to Joseph Harrison, Esq., Chairman of the Company, on or before Tuesday, the 9th of November next.
DIXON ROBINSON, Clerk to the Company.
Blackburn, Oct. 22, 1875.

STATION-METER, second-hand, for SALE, in good condition. Capable of passing 8000 feet per hour, together with bye-pass, valves, and connexions complete. To be sold to make room for a larger one.
Apply to Mr. C. TURNER, Manager, Gas-Works, Ravensthorpe, MIRFIELD.

STATION-METER for Sale, in good condition (Makers West and Gregson) in very ornamental case, fitted up with tell-tales, inlet, outlet, and bye-pass valves, and 12-in. connexions. Passes 25,000 cubic feet per hour. Now replaced with a larger one.
For price, &c., apply to JOHN W. WHITAKER, Manager, Gas-Works, WAKEFIELD.

MR. HODGSON JONES, Memb. Inst. Civil Engineers of London and of Paris, has REMOVED his Offices to 26, Great George Street, London, S.W., where he may be consulted on all questions relating to Gas and Water Works, Drainage, Sanitary Works and Estate Improvements.

T. NEWBIGGING,
CONSULTING GAS ENGINEER,
ECCLES, MANCHESTER.

HENRY LYON,
CONSULTING GAS ENGINEER,
BROOKLYN, CHEETHAM HILL ROAD,
MANCHESTER.
Twenty-three years at the Rochdale Road Works.

D. M. NELSON,
48, GORDON STREET (late 135, BUCHANAN ST.),
GLASGOW,
Supplies every requisite in connexion with the distribution of Gas and Water.
Estimates and prices on application.
WOOD GRIDS for Purifiers and Scrubbers.
Cast-Iron PIPES and VALVES.
Street LAMP-PILLARS.
Patent Pipe SCREWING-MACHINES, &c.

Mr. ALFRED LASS,
60, CORNHILL, LONDON, E.C.,
Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.
To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.
To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

TO INVENTORS AND PATENTEES.
MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.
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REGISTRATION OF DISTRIBUTORY PLANT.
The forms for this purpose are to illustrate the Paper on Distribution of Gas, read at the Edinburgh Meeting of the British Association of Gas Managers. By the use of the synopsis the whole of the out-door plant may at once be seen, with all matters pertaining to the same.
W. J. WARNER, Engineer.
South Shields.

THOMAS ALLAN & SONS, of Springbank Iron-Works, Glasgow, manufacture small cast-iron GAS AND WATER PIPES, 1½ to 6 inches, at their branch works, Stockton-on-Tees, and have at present large stock, which they are open to sell at moderate prices

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.
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As supplied to the English, French, and Dutch Admiralties, and principal Railways and Engineers at Home and Abroad.

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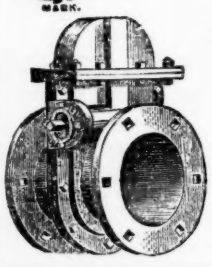
WITH WROUGHT-IRON PINIONS,


List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
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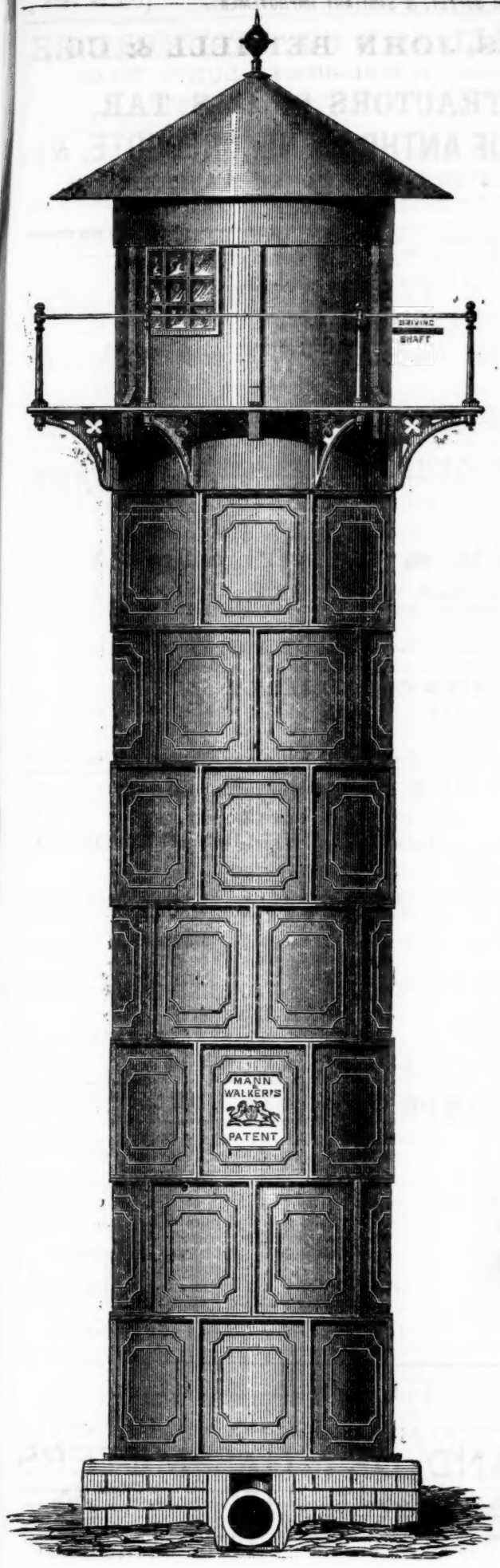

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By Letters Patent in Great Britain, Europe, and the United States of America.

The improvements made during the past three or four years in all the parts of the internal and external construction and machinery of these Scrubbers have rendered them perfect for their work of purification with all kinds of coal, and their cost is less than any other method of completely purifying gas from ammonia.

They contain their own motive power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, **nearly one hundred being in use,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

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COTTERILL'S PATENT STEEL TUBE-DRILLS, for connecting services to water-mains, *under pressure*, without turning off the water. They drill and tap themselves, and are left in the mains. Made of all sizes, from ¾ to 2 inches and upwards. They cost less than the ordinary plan.

Apply to CHARLES FORSTER COTTERILL, Cannock, STAFFORD, Patentee.

IN THE MATTER OF BRONNER'S PATENT BURNERS.

NOTICE is Hereby Given that Julius Brönner, on the 20th of April, 1875, in a suit in Chancery, 1874, B 365, obtained an injunction perpetually restraining the Defendant, his Agents, Servants, and Workmen, from in any way advertising or offering for sale, or selling, or from in any manner causing to be advertised, or offered for sale, or sold as "Real Brönner," or "Brönner," or "Broehner" Burners, any Burner not manufactured by or for the Plaintiff, Julius Brönner, or by his Agents.

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JULIUS BRÖNNER, Frankfort-on-Maine.

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BRAY'S PATENT "ENAMEL" REGU-LATOR GAS-BURNERS.

At the meeting of the North British Association of Gas Managers, held in Dundee in July last, the President, G. R. HISLOP, Esq., spoke very highly of a Gas-Burner, the name of which he did not give. In reply to letter from us, we received the following:—

"Gas-Works, Paisley, Aug. 17, 1875.

"Geo. R. Hislop, Engineer and Manager.

"Dear Sirs,—Your letter and circular referring to your Gas-Burners are to hand, and it will be gratifying to you to know that the Burners I referred to at the meeting of the North British Association of Gas Managers, held in Dundee last month, were your 'Regulator Burners.' I have not only purchased these exclusively for a considerable time past, but have very largely recommended their use to parties in different parts of the country—a fact, the bare mention of which should suffice to convey to you the high opinion I hold of the Burners of your manufacture. But, further, while second to the old iron burners only in price, they are second to none in the economic elicitation of light from a given quantity of gas, burned, of course, under conditions of pressure and volume proper to the size of each burner.

"I am, dear sirs, yours faithfully,
"GEO. R. HISLOP.

"Messrs. Geo. Bray and Co."

☞ *The Price is little more than common Burners.*

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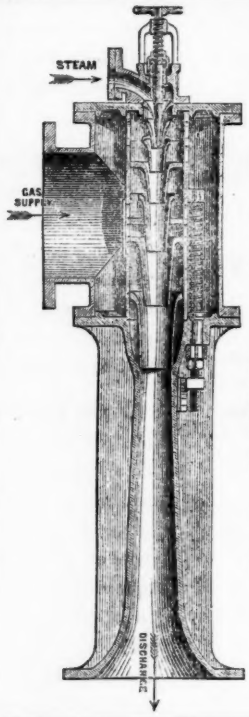

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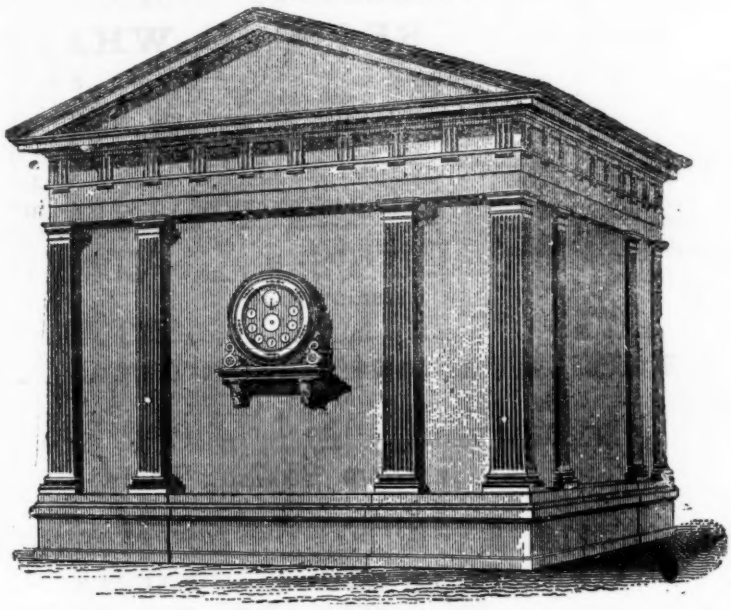

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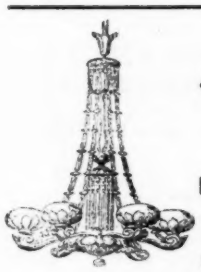

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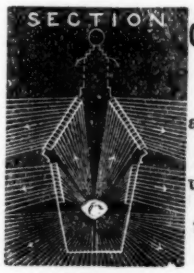

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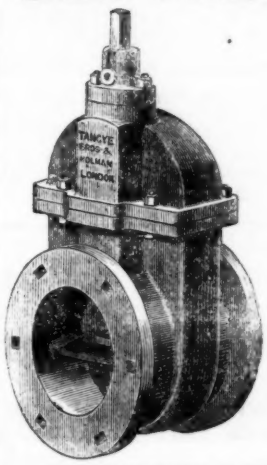

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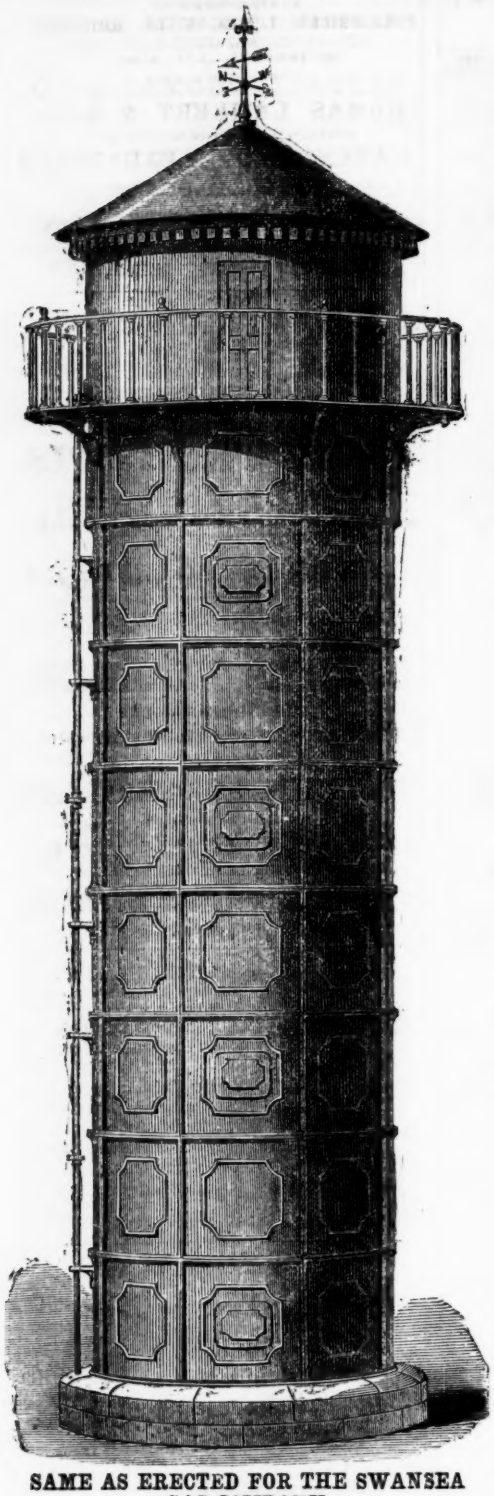

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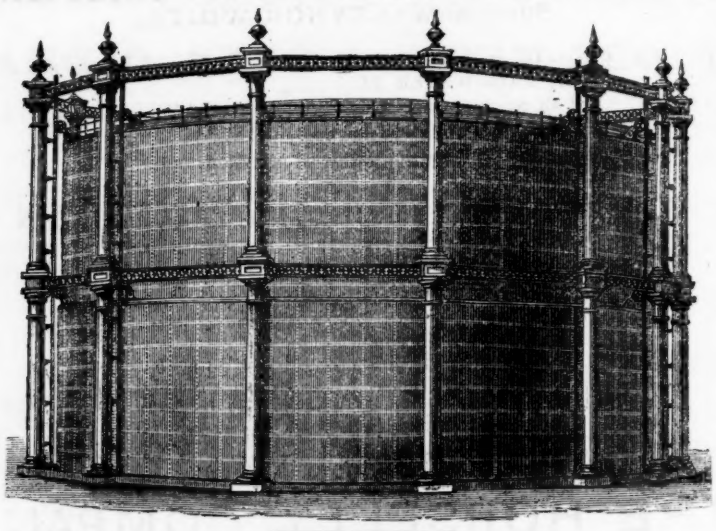

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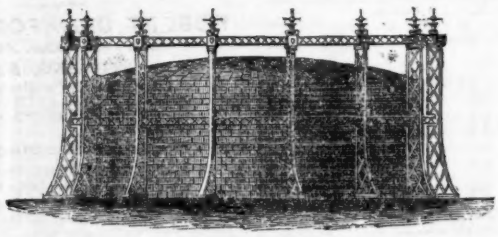

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GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

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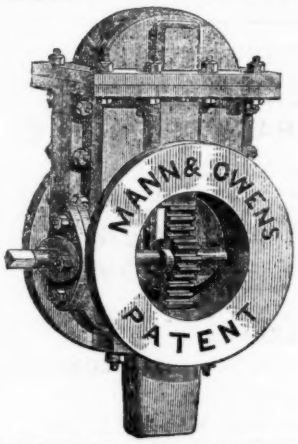
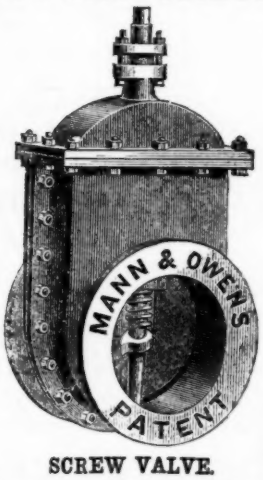
MANN & OWENS' PATENT GAS-VALVE.



RACK AND PINION VALVE.



SCREW VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:

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HYDRAULIC AND GENERAL ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

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MANUFACTURE EVERY DESCRIPTION OF

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SELF-FEEDING ARRANGEMENT

Specially constructed for Country use.

No. 2 . . . 25 lights, £30.

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Larger and smaller sizes in course of construction.

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FOR

GAS PURIFIERS & SCRUBBERS.

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"SELLARS' CEMENT"

PREVENTS WASTE OF GAS FROM RETORTS;

SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;

GREATLY ECONOMIZES THE USE OF FIRE-BRICKS;

And PREVENTS ALL POSSIBLE LOSS of GAS FROM LEAKAGE.

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Our New and Choice Designs for the above, with prices, are forwarded to any part of the world on receipt of twelve stamps. Estimates for work at home or abroad.

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18 & 20, ALSTON STREET, GLASGOW.

CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B. ON CLYDE.

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LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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Yields 13,320 cubic feet of 32·5-candle gas per ton.

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BICKERSHAW PITS, WIGAN,

Of the Abram Colliery Company, are worthy the attention of gas producers, showing a good yield of gas and a large residuum of excellent coke. When blended with one-seventh cannel, the gas is of specially high illuminating power.

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Analysis and Price on Application.

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WYLAM WOOD CANNEL COAL WORKED FROM ABOVE COLLIERY.

Analysis—10,280 cubic feet of gas per ton of Coal, having an Illuminating Power of 26·2 Sperm Candles, and yields 13¼ cwt of Coke per ton of Coal.

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AXWELL COLLIERY COMPANY,

Near NEWCASTLE-ON-TYNE,

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Analysis—10,000 cubic feet of Gas per ton of Coal, having an illuminating value equal to 26 standard sperm candles, with a yield of 13½ cwts. of Coke per ton of Coal.

Supply also Gas and Coking Coals from the best seams.

Shipments at Tyne Dock and South Dock, Sunderland.

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POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over 10,000 cubic feet of gas, with an illuminating power of 16 candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

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The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

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Established 1840.

C. T. GRANT & CO. COAL BROKERS GLASGOW.

Scotch Churls

PRESENT PRICE:

5s. 6d. per Ton at Pit.

8s. 9d. ,, F.O.B.

Cubic Feet.	Illuminating Power.	Coke (sup. qual.).
10,000 ..	20 candles. ..	12 cwt.

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WOOD PURIFIER SIEVES,

Which have now been used for twelve years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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COPPA COLLIERY, MOLD,

Beg leave to call the attention of Gas Companies to the superior quality of their

CANNEL FOR GAS-MAKING PURPOSES.

This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.

Ports of shipment—Birkenhead or Connah's Quay.

Waggons supplied for delivery by railway to any part of England or Wales.

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Supply and Contract for all the principal Scotch Gas Coal (including BOGHEAD, HARTHILL, CHAPELSIDE, LESMAHAGOW, and BRAEHEAD), f.o.b., or delivered at home or abroad.

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This Coal yields 11,000 cubic feet of gas and 13½ cwts. of coke per ton.

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GAS COAL MERCHANT,

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Delivery per Rail to any Part.

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THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD,

STRONGLY RECOMMEND A TRIAL OF THEIR

CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

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THE DERBYSHIRE

SILKSTONE COAL COMPANY, LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

ANALYSIS AND PRICES ON APPLICATION TO

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THE LOCHORE AND CAPLEDRAE CANNEL COAL COMPANY, LIMITED.

Works: LOCHORE by LOCHGELLY, FIFESHIRE. Office: 19, MAITLAND STREET, EDINBURGH.

This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.	Sample worked at Lochore
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	34·83
Value of 1 cubic foot of gas in grains of sperm	780	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	71 minutes.
Gravity of the gas (air = 1000)	596	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

	Capledrae Waverley.	Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	33·09
Value of 1 cubic foot of gas in grains of sperm	878	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	67 minutes.
Gravity of the gas (air = 1000)	677	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company, at

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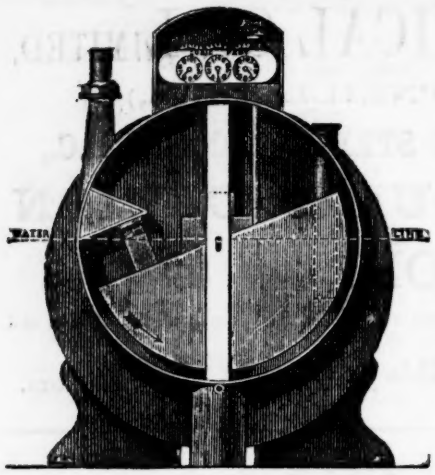

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"Unquestionably the best Water Gas-Meter now in use."—Thos. G. Barlow, C.E.

Over 90,000 in action.

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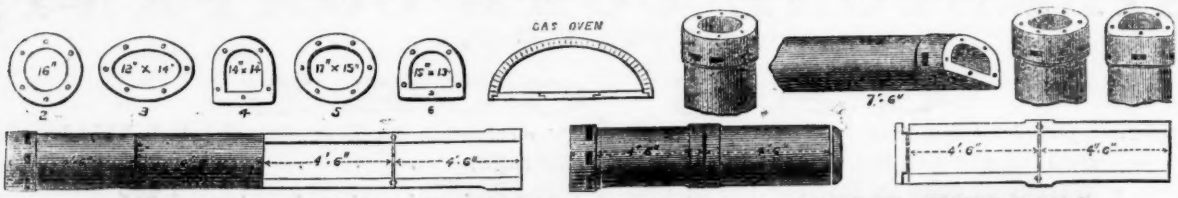

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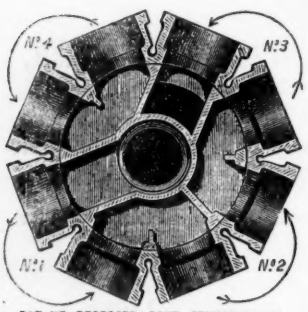

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Sectional Plan.

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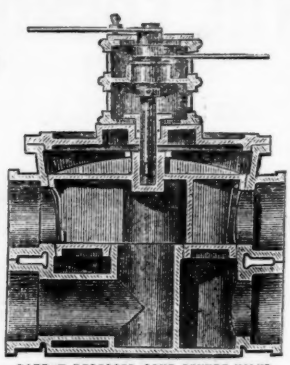
Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

Of all descriptions.



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Invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

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DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

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